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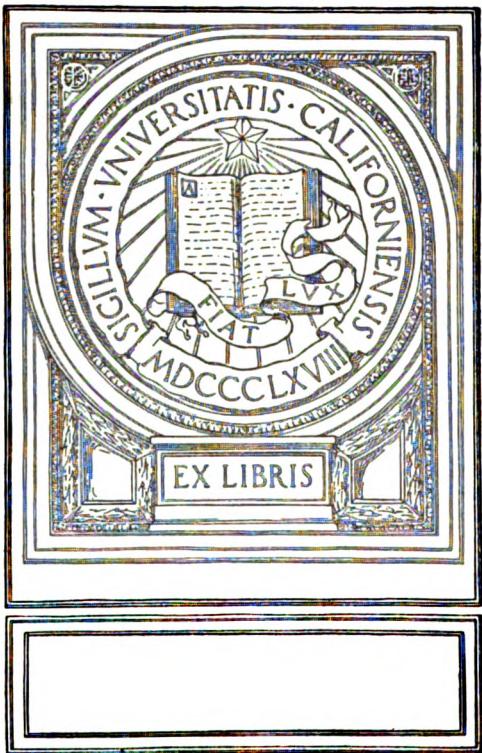
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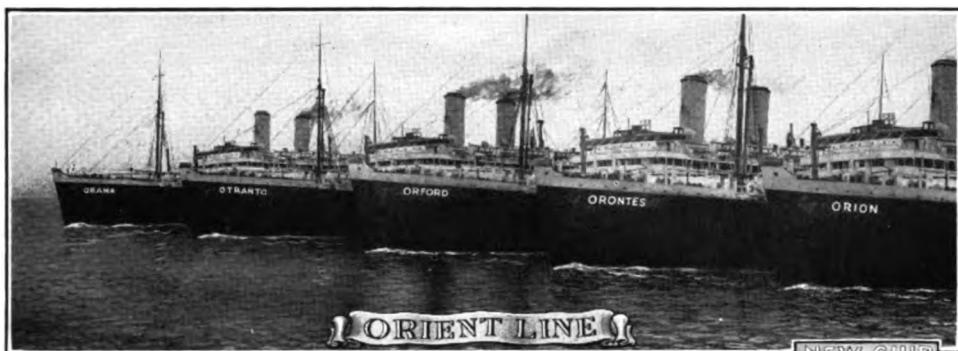
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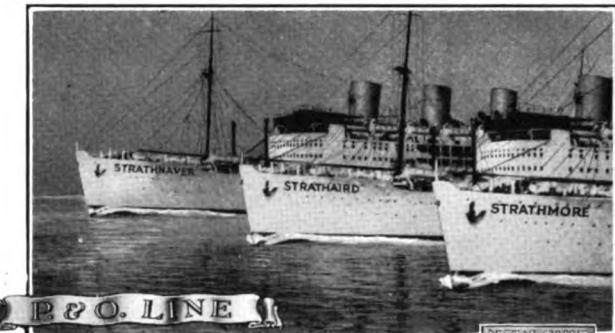




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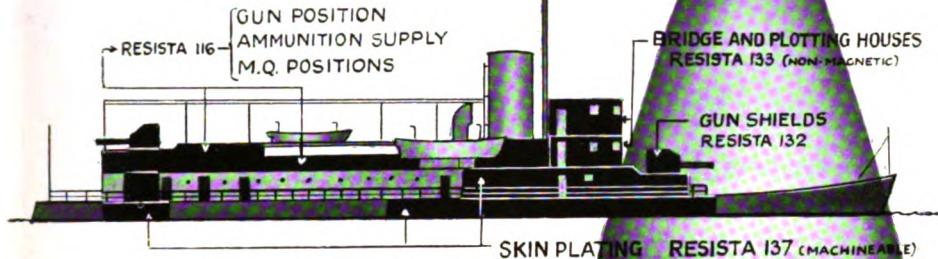
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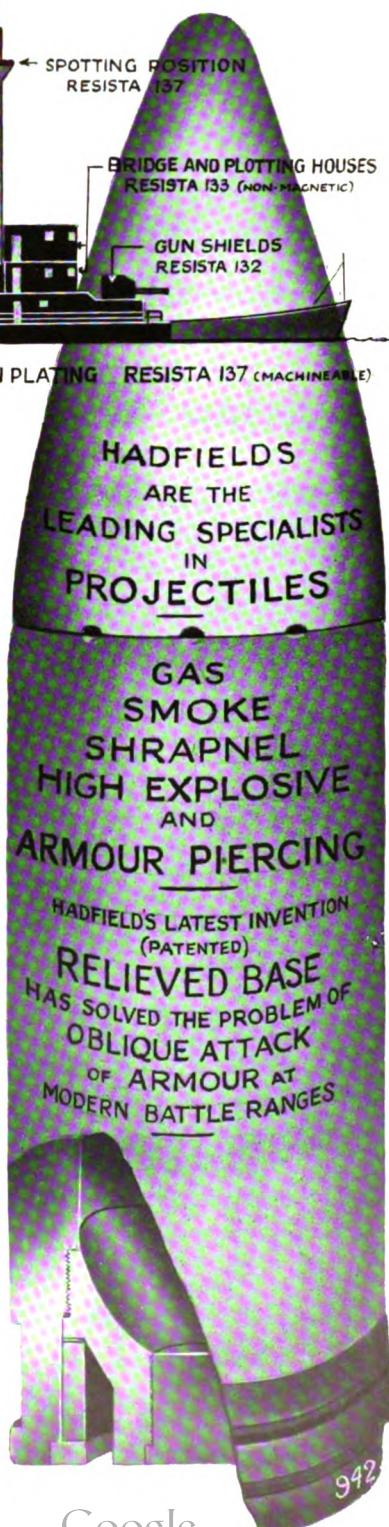


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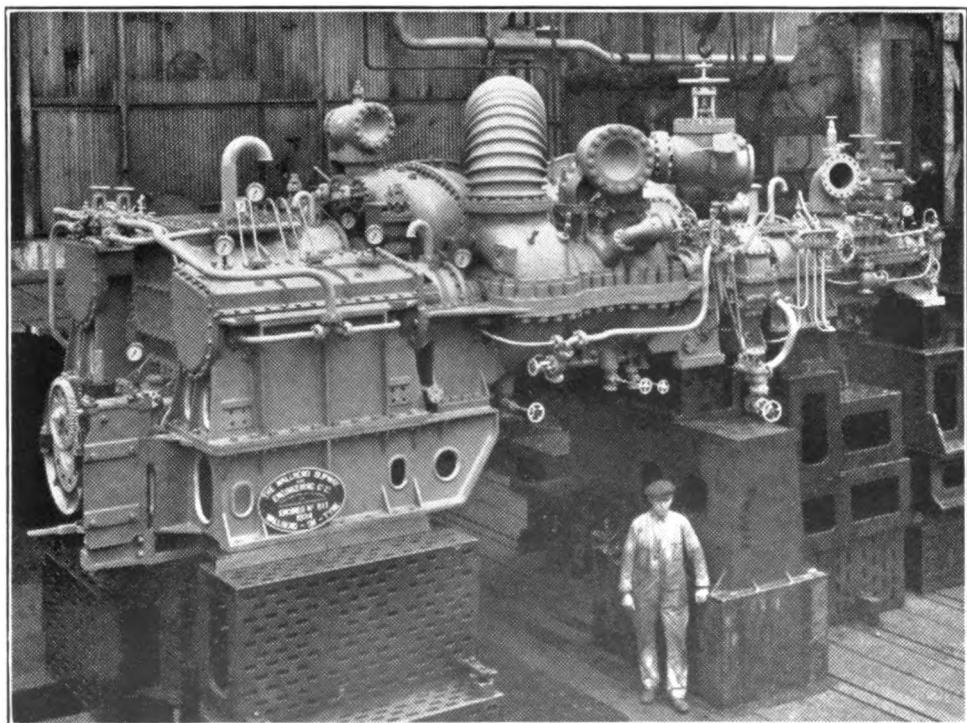


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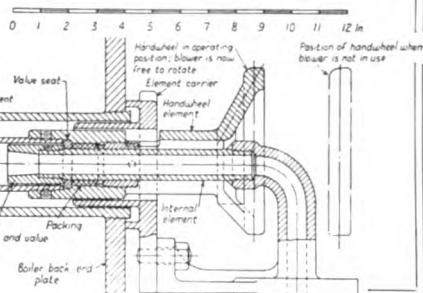


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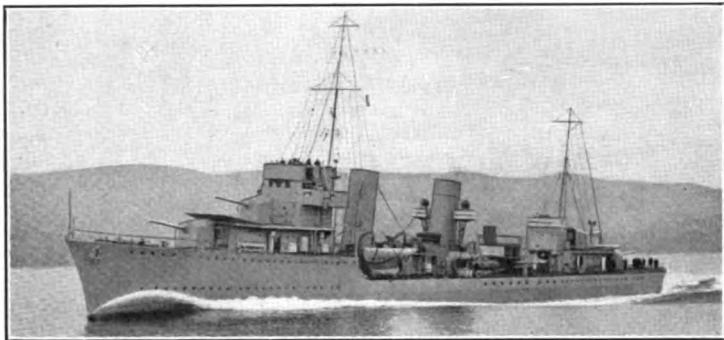
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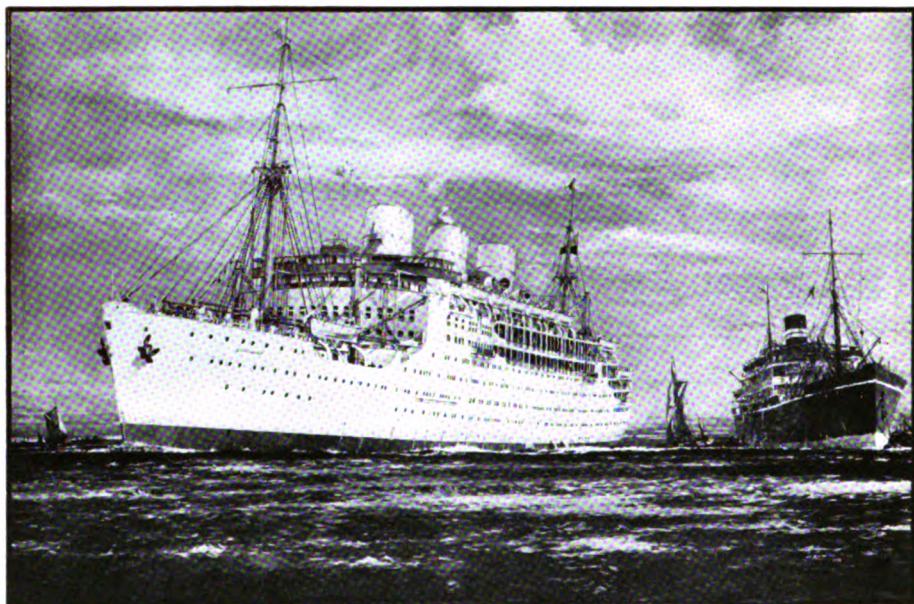
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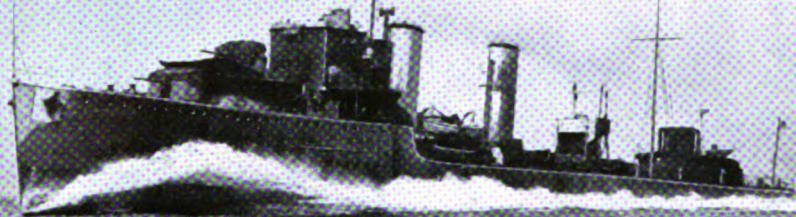
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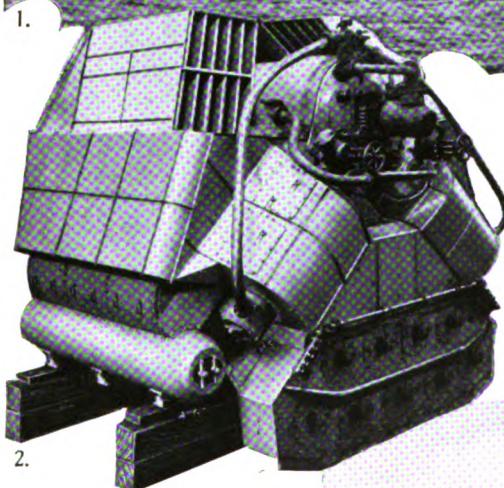
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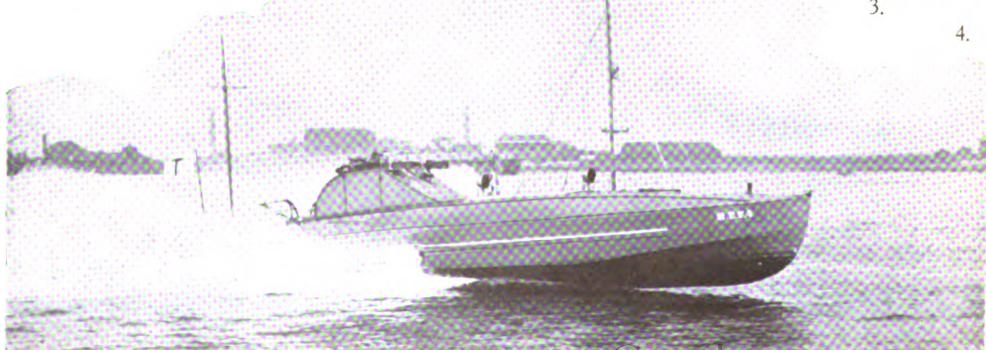
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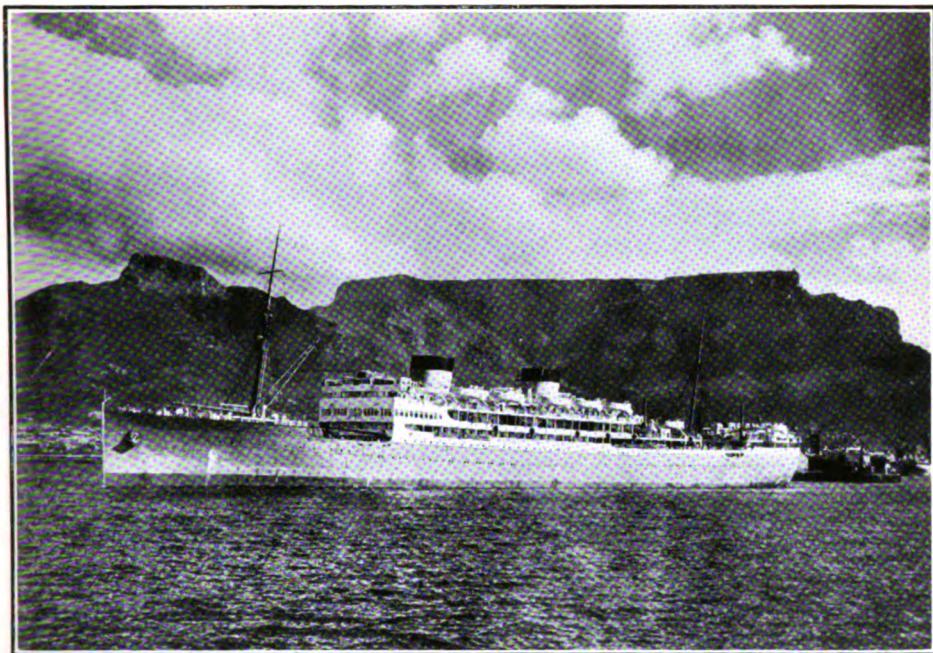
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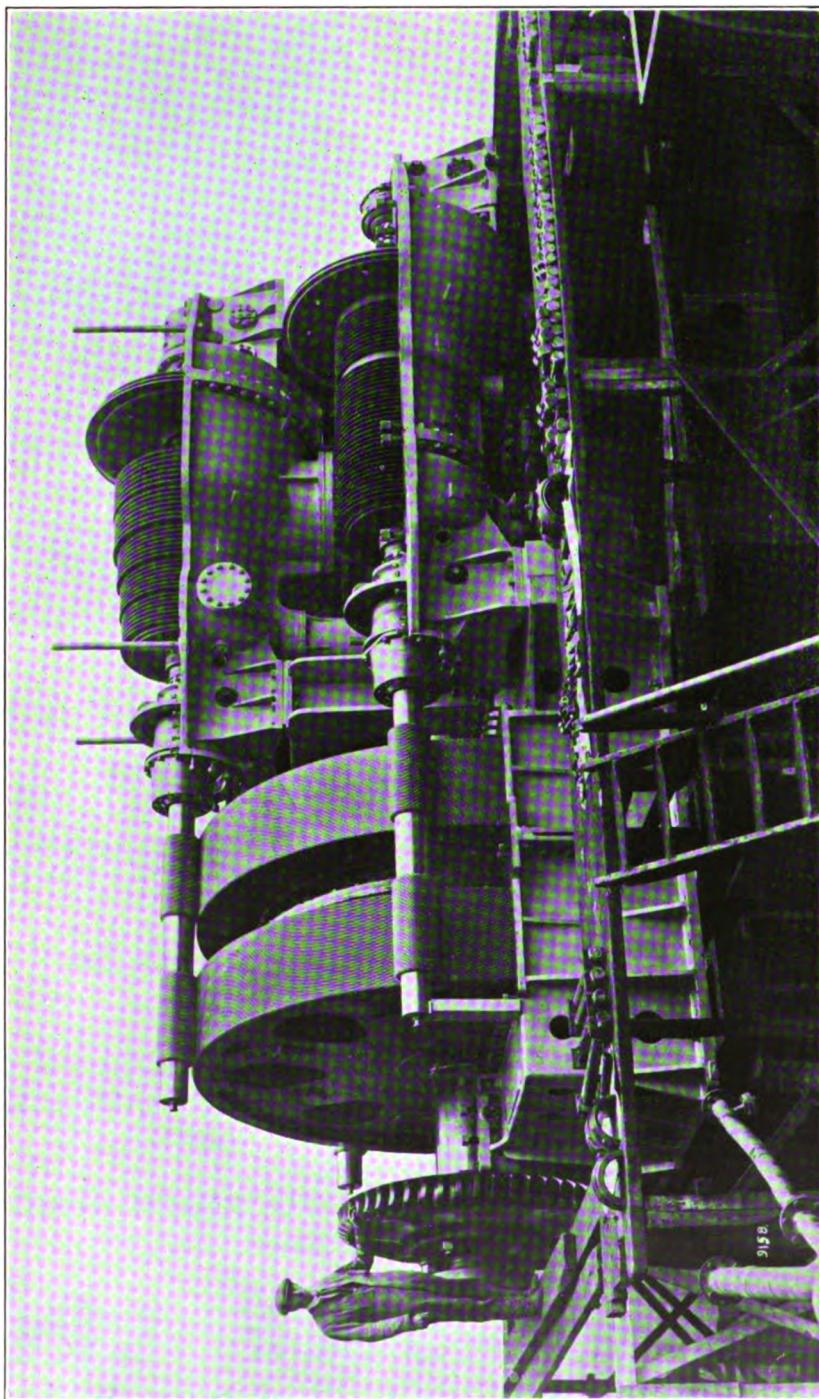
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FORTY-SIXTH YEAR OF PUBLICATION.

LONDON:  
WILLIAM CLOWES AND SONS, LIMITED,  
94, JERMYN STREET, S.W. 1.

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## CONTENTS.

---

	PAGE
PREFACE .. . . . .	viii
SUMMARY OF CONTENTS .. . . . .	xi

## NAVAL SECTION.

### CHAPTER I.

NAVAL FORCES OF THE BRITISH EMPIRE	<i>Commander C. N. Robinson, R.N.</i>	1
------------------------------------	---------------------------------------	---

### CHAPTER II.

FOREIGN NAVIES .. . . .	<i>Captain E. Altham, C.B., R.N.</i>	29
-------------------------	--------------------------------------	----

### CHAPTER III.

RELATIVE NAVAL STRENGTH .. . . .	<i>G. H. Hurford</i>	49
----------------------------------	----------------------	----

### CHAPTER IV.

DISARMAMENT AND NAVAL POLITY		
<i>Captain Alfred C. Dewar, O.B.E., R.N., B.Litt. Oxon.</i>		61

### CHAPTER V.

JAPAN AND HER NAVY .. . .	<i>Commander S. Takagi, I.J.N.</i>	74
---------------------------	------------------------------------	----

### CHAPTER VI.

NAVAL MANŒUVRES OF 1934 .. .	<i>Rear-Admiral H. G. Thursfield</i>	85
------------------------------	--------------------------------------	----

## MERCHANT SHIPPING SECTION.

### CHAPTER VII.

STANDING OF THE WORLD'S MERCHANT FLEETS .. .	<i>John P. Taylor</i>	97
--	-----------------------	----

### CHAPTER VIII.

THE GOVERNMENT AND BRITISH SHIPPING .. .	<i>Cuthbert Maughan</i>	111
--	-------------------------	-----

### CHAPTER IX.

MERCANTILE MARINE MACHINERY .. . .	<i>R. J. Buller, M.Inst.N.A.</i>	121
------------------------------------	----------------------------------	-----

### CHAPTER X.

NOTABLE MERCHANT SHIPS OF THE YEAR .. . .	<i>"A.M.I.N.A."</i>	132
---	---------------------	-----

### CHAPTER XI.

THE ROYAL NAVAL RESERVE .. . .	<i>Francis E. McMurtrie</i>	142
--------------------------------	-----------------------------	-----

## AIR SECTION.

	CHAPTER XII.	PAGE
THE FLEET AIR ARM ..	.. . . . .	“ <i>Volage.</i> ” 155
	CHAPTER XIII.	
FOREIGN FLEET AIR ARMS ..	.. . . . .	“ <i>Albatross</i> ” 167
	CHAPTER XIV.	
CIVIL AVIATION ..	.. . . . .	<i>Leonard Bridgman</i> 180

## NAVAL REFERENCE SECTION.

STATEMENT EXPLANATORY OF THE NAVY ESTIMATES, 1934 ..	193-202
THE 1934 NAVAL CONSTRUCTION PROGRAMME .. ..	202-203
ABSTRACT OF NAVY ESTIMATES, 1934 .. ..	204-205
NAVAL EXPENDITURE OF THE PRINCIPAL FOREIGN POWERS ..	206-208
BRITISH AND FOREIGN NAVIES—PRINCIPAL OFFICIALS .. ..	209
BRITISH AND FOREIGN NAVAL ATTACHÉS .. ..	210
DIMENSIONS AND PARTICULARS OF BRITISH AND FOREIGN WARSHIPS ..	213-253
SHIPS OF THE LESSEE NAVIES .. ..	254-260
BRITISH AND FOREIGN FLOTILLAS .. ..	261-287
TABLES OF COMPARATIVE NAVAL STRENGTH .. ..	291-296

## BRITISH AND FOREIGN ORDNANCE TABLES.

GUNS AND MOUNTINGS OF BRITISH MANUFACTURERS .. ..	299-306
BALLISTICS OF GUNS OF VARIOUS POWERS .. ..	307-314

## MERCHANT SHIPPING REFERENCE SECTION.

TOTAL MERCHANT TONNAGE OWNED .. .. .. ..	317-320
MOTORSHIP TONNAGE .. .. .. ..	321-322
TANKER TONNAGE .. .. .. ..	323
VESSELS LAUNCHED, UNDER CONSTRUCTION, AND LOST .. ..	324-326
LARGEST MERCHANT SHIPS .. .. .. ..	327-333
VESSELS CLASSED BY VARIOUS SOCIETIES .. .. .. ..	333
SPEEDS AND FAST VOYAGES .. .. .. ..	334-335
MARINE MACHINERY .. .. .. ..	336-339
ENTRANCES AND CLEARANCES .. .. .. ..	340-341
SUEZ CANAL TRAFFIC .. .. .. ..	342
PANAMA CANAL TRAFFIC .. .. .. ..	343-344
FREIGHT RATES .. .. .. ..	345

## CONTENTS.

V

	PAGE
LAID-UP TONNAGE .. . . . .	346
PAY IN MERCHANT SERVICE .. . . . .	346
EXPORTS OF NEW SHIPS FROM UNITED KINGDOM .. . . . .	347
IRON AND STEEL PRICES .. . . . .	347
DISTANCES FROM BRITISH TO FOREIGN PORTS .. . . . .	348

## AIR REFERENCE SECTION.

BRITISH NAVAL AIRCRAFT TYPES .. . . . .	351
R.A.F. SHORE-BASED AIRCRAFT FOR NAVAL CO-OPERATION .. . . . .	352
AIRCRAFT ENDURANCE .. . . . .	352
DISTRIBUTION OF AIRCRAFT IN THE FLEET .. . . . .	353
SHIPS FITTED WITH CATAPOULTS .. . . . .	353
UNITED STATES NAVAL AIR SERVICE .. . . . .	354
JAPANESE NAVAL AIR SERVICE .. . . . .	355
FRENCH NAVAL AIR SERVICE .. . . . .	356
ITALIAN NAVAL AIR SERVICE .. . . . .	357 ✓

## PROFILES AND PLANS.

*S. H. Watson, R.C.N.C.*

PROFILES OF WARSHIPS .. . . . .	P3-P22
CAPITAL SHIPS .. . . . .	P3-P7
AIRCRAFT CARRIERS .. . . . .	P8-P10
CRUISERS AND COAST DEFENCE SHIPS .. . . . .	P11-P19
FLOTILLA LEADERS AND DESTROYERS .. . . . .	P20-P22
PLANS OF WARSHIPS .. . . . .	P25-P104
PROFILES OF MERCHANT SHIPS .. . . . .	P107-P166
FOUR-FUNNEL .. . . . .	P107
THREE-FUNNEL .. . . . .	P108-P113
TWO-FUNNEL .. . . . .	P114-P131
ONE-FUNNEL .. . . . .	P132-P166

GENERAL INDEX .. . . . .	..	}
INDEX TO PROFILES AND PLANS OF WARSHIPS .. . . . .	..	
INDEX TO PROFILES OF MERCHANT SHIPS .. . . . .	..	

*at end of Volume.*

## LIST OF ILLUSTRATIONS

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### NAVAL SHIPS.

	<i>facing page</i>
Hawker Osprey Seaplane being Catapulted . . . . .	1
H.M. Flotilla Leader <i>Exmouth</i> . . . . .	10
H.M. Minesweeping Sloop <i>Halcyon</i> . . . . .	10
H.M. Australian Cruiser <i>Sydney</i> . . . . .	22
The U.S. Destroyer <i>Farragut</i> . . . . .	32
The German Cruiser <i>Königsberg</i> . . . . .	41
The Colombian Destroyer <i>Antioquia</i> . . . . .	50
The Portuguese Submarine <i>Delfim</i> . . . . .	58
H.M. Submarine <i>Severn</i> . . . . .	62
H.M. Destroyer <i>Esk</i> . . . . .	70
H.M. Destroyer <i>Electra</i> . . . . .	70
H.M. Cruiser <i>Neptune</i> . . . . .	86

### MERCHANT SHIPS.

	<i>facing page</i>
The Cunard White Star Turbine Liner <i>Queen Mary</i> . . . . .	100
The Cie. Générale Transatlantique's Turbo-electric Liner <i>Normandie</i> . . . . .	108
The Royal Mail Turbine Liner <i>Asturias</i> . . . . .	116
The Shaw, Savill and Albion Motor Liner <i>Waiwera</i> . . . . .	124
The London, Midland and Scottish Railway's Cross-Channel Turbine Steamer <i>Princess Maud</i> . . . . .	134
The Belgian State Railways' Cross-Channel Motorship <i>Prince Baudouin</i> . . . . .	142
The Forth Diesel-Electric Ferry-Boat <i>Queen Margaret</i> . . . . .	142
The Southern Railway's Train-Ferry <i>Twickenham Ferry</i> . . . . .	142

## AIRCRAFT

The Fairey Seal .. . . . .	facing page	92
The Fairey Seal Fleet Spotter Reconnaissance Aircraft ..	}	160
The Blackburn Baffin Torpedo Bomber .. . . .		
The Blackburn Shark Torpedo Spotter Reconnaissance Aircraft ..	}	165
The Vickers-Supermarine Scapa Flying Boat .. . . .		
The Blackburn Perth Flying Boat .. . . .	}	168
The Hawker Nimrod Fleet Fighter .. . . .		
The Hawker Osprey Fleet Fighter Reconnaissance Aircraft ..	}	174
The Vickers Vildebeest Torpedo Bomber .. . . .		
The Supermarine Seagull Amphibian .. . . .	}	182
The D.H. Comet Monoplane .. . . .		
The Airspeed Envoy Monoplane .. . . .	}	188
The Vickers Vellox Biplane .. . . .		

## P R E F A C E .

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WITH this forty-sixth issue of "Brassey's Naval and Shipping Annual," a further change in its contents has been made in order to keep the volume abreast of progress. After the War, it may be remembered that, as well as the recognised features of the "Naval Annual" being maintained, "in view of the close ties which were cemented during the Great War between the Royal Navy and the Mercantile Marine," it was thought desirable to devote a section of the "Annual" to merchant shipping and its varied problems.

Now another development has been made as a consequence of the growing importance of the Air Arm to the Navy. It has been thought well to devote a separate section of the work to the air forces of the Powers. These have been dealt with under three heads —the Fleet Air Arm of the Royal Navy ; the corresponding air forces of foreign countries ; and civil aviation in its relation to Service affairs. This change has its counterpart in the addition of a new Air Reference Section to the volume, in which will be found particulars of the various types of aircraft corresponding to those given in past years concerning the warships of the world.

Thus, in one volume are now brought together the three great branches of that sea power which is so vitally concerned in the security of the Empire—the Royal Navy, the Merchant Navy, and the Air Force. Ever since the War it has been generally accepted that the Merchant Marine, alongside the Royal Navy, is essential for the defence of these islands and for preserving our oversea communications. Now the ever-increasing part played by the Air Force is receiving its due recognition. As the First Lord of the Admiralty said in the House of Commons during the Navy Estimates debate on March 12, 1934 :—

" Both these Services are vitally necessary for the defence of our Empire. In my opinion, the two Services are peculiarly complementary, and, if I see the future aright, I think that they will become more and more complementary as time progresses. The Fleet depends more and more upon our Naval Air Arm. We regard it as the spear-head of the Fleet, and we are prouder of it than of any other branch of our Naval Service."

It is in keeping with this view that greater prominence is given to flying in the oldest of the world's naval year-books.

In accordance with the tradition established by the first Lord Brassey when he founded the "Annual" nearly half a century ago, the pages of the work continue to be open for contributions expressing the views of authorities in foreign countries. At the present time, the eyes of the world are particularly directed towards Japan as a consequence of her attitude towards the naval conversations in London. In this issue will be found a chapter by a Japanese naval officer, who deals with the question of naval limitation as it appears to his countrymen. At a moment when Japan has denounced the Washington Treaty and when the London Treaty is also in the melting pot, this essay is bound to command the earnest attention of readers of the "Annual" in many countries. As the author is an officer on the active list, an instructor at the Imperial Naval College at Tokyo, it may be supposed that he expresses the official point of view in regard to the important problem with which he deals.

The other special articles in the Naval Section are by well-known contributors, whose work will be found most comprehensive and illuminating, both for present guidance and future reference. In view of the important manœuvres carried out by the principal foreign navies during 1934, it has been thought advisable to devote a chapter to this subject, and this has been written by an officer recently retired from active service, Rear-Admiral H. G. Thursfield. We are particularly glad to welcome Rear-Admiral Thursfield to the pages of the "Annual," in which over forty years ago his distinguished father, the late Sir James Thursfield, wrote on a similar subject.

In the Merchant Shipping Section, political, technical, and commercial aspects of maritime trade are discussed by a group of authorities who have served the "Annual" well for many years, and who deal with the Merchant Navy particularly in relation to its position as a reserve for the Fighting Fleet. The personnel side is discussed by Mr. F. E. McMurtrie in his article on the Royal Naval Reserve, upon which he has written in a previous issue of the "Annual."

The chapters in the new Air Section dealing respectively with the British and Foreign Fleet Air Arms are by officers who, although they prefer to remain anonymous, have a special and intimate knowledge of their subjects. The weakness of the British Fleet Air Arm is shown conclusively by a comparison of the facts given in these two chapters. It is also apparent that it is becoming more and more essential that the personnel of these forces should be seamen as well as airmen. The third chapter, by Mr. Leonard Bridgman, falls naturally into place in this Section in view of its examination of the value of civil aviation for service purposes, and the extent to which civil aircraft could be adapted for military use.

On his appointment to the staff of Devonport Dockyard, Mr. L. T. Carter, R.C.N.C., relinquished the charge of the Naval Reference Section, for which he had been responsible since 1931. By permission of the Director of Naval Construction, Mr. S. H. Watson, R.C.N.C., has succeeded him in this work. New plans in this edition are not restricted to the larger types of vessel ; in particular, one of the most interesting is that of the Norwegian minelayer and training ship, Olav Trygvason (p. p86), a type of vessel which is frequently advocated for convoy purposes and to supplement cruiser squadrons on foreign stations. New silhouettes will be found of the Soviet battleships Marat and Paris Commune, and the new aircraft carriers Kaga and Ryujo (Japan), and Ranger and Langley (U.S.A.). The curious-looking profiles of the new Japanese cruisers (p. p13) will excite interest in comparison with older types on the same page. As usual, there are several photographs of the newer types of warships and aircraft.

It is again our privilege to acknowledge the cordial help of numerous authorities and correspondents, and in particular the Naval Attachés of foreign countries in London, the various Government departments, Lloyd's Register, the Chamber of Shipping, and other bodies, as well as the shipbuilding, engineering, and aircraft manufacturing firms. The assistance they have given has been of the greatest value in helping to make this issue of the "Annual" as complete and accurate as possible.

THE EDITORS.

*December, 1934.*

## SUMMARY OF CONTENTS.

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A CHANGE in the attitude of the Government towards naval defence is noted in the opening chapter. A halt has been called in the policy of one-sided disarmament pursued for some years, and steps to restore a measure of the country's strength at sea have been or are about to be taken. Progress in new construction is recorded. As regards personnel, officers' pay has been stabilised, surplus lieutenant-commanders have been retired, entries at Dartmouth have been increased, and changes introduced in the organisation of the medical, physical training, and signal branches. The National Maritime Museum came into being during 1934. A new cruiser, the Sydney, was launched for the Australian Navy, and the Royal Indian Marine at length attained its desired status as the Royal Indian Navy ; on the other hand, the seagoing force of the South African Naval Service was disbanded.

Captain Edward Altham, C.B., reviewing the progress of foreign navies, considers that the outstanding feature is the revival of interest in the capital ship, a sequel to the building by Germany of the "Deutschland" class. In 1934 the United States adopted a policy of new construction up to the full extent permitted by the Washington and London Treaties, while Japan claimed the right to equality in place of her 60 per cent. ratio as compared with the two strongest Powers. France began the construction of a second battle cruiser, and Italy the construction of two battleships of maximum displacement (35,000 tons) allowed by treaty. Shipbuilding in Germany proceeds steadily according to plan, but there are no signs of a breaking away from treaty obligations. The customary details are given of the progress of minor navies.

Dealing with comparative naval strength, Mr. G. H. Hurford contrasts the reduction in British cruiser strength since the London Treaty with the increased strength of other signatories. Battleship construction is proceeding in Germany, France, and Italy, and these Powers may have nine new battleships afloat before Great Britain can begin the replacement of her battleships in 1937. Only 34 of the 50 British cruisers are within the official age limit of sixteen years. A further reduction to 49 cruisers must be made if the London Treaty is adhered to. In destroyers, Great Britain will be over 40 vessels short of treaty strength in 1936. Her total of aircraft available for naval purposes is about 800, compared with 1,000 in the United States (to be increased to 2,184).

Captain A. C. Dewar traces the progress of the movement towards disarmament, with the "labourers plenteous but the harvest small." He shows that these deserts of discussion are not entirely barren, for in them the fallacies of the extreme pacifist outlook have been forced to the surface and laid bare. Another lesson to be learnt from Geneva is that nationality is a real thing not to be

exorcised by a wave of the pacifist wand. It is shown that the theory that the engine of economic pressure can take the place of the gun and bomb to bring a treaty breaker to reason is untenable ; it would quickly develop into a state of actual war.

In view of the attitude of Japan towards the London Treaty, special importance attaches to the chapter by Commander S. Takagi, I.J.N. He explains why the Japanese people have an inherent and ever-present fear of outside interference as the result of their experiences after past wars. The situation created by the London Treaty created internal dissatisfaction and anxiety. Japan is faced with a very complex situation in Eastern Asia. What she really needs and earnestly desires are trade and security. Therefore she cannot but be concerned about her Navy as a means of assuring security in the Far Eastern seas, and for the protection of the world-wide trade now necessary for her very existence.

The year 1934 was notable for the manœuvres which were carried out by all the signatory Powers to the Washington and London Treaties. A chapter is therefore devoted to these exercises, written by Rear-Admiral H. G. Thursfield. The Royal Navy has reason to be satisfied with its performances on manœuvres, but every reason "to be dissatisfied with a provision of material which relies largely upon over-age ships as the equivalent of modern ones." Most of the naval problems which exercise the minds of the French seem to be connected with the transport of troops from Africa to France. Italian manœuvres were notable for the fact that the oldest ship taking part in them joined the fleet in 1927. United States manœuvres were on a large scale, operations covering 1,200 miles and extending over a week. Japanese manœuvres were also on a large scale, employing the whole fleet, but details were not disclosed.

#### MERCHANT SHIPPING SECTION.

A very definite shrinkage of world tonnage is noted by Mr. John P. Taylor in his customary survey of the merchant fleets, and the rate of shrinkage is increasing, principally owing to the number of vessels sold for breaking up. Yet although steamships and sailing ships decreased, motorships advanced. The British proportion of world tonnage has declined from 41·6 in 1914 to 27·4 in 1934. The number of ships with steam reciprocating engines continues to decline materially, and the steam turbine has also lost ground. Of the tonnage owned in Great Britain and Ireland, the proportion over twenty years old is only 19·7 per cent., whereas the proportion of that abroad is 31·4 per cent. Changes as regards fuel continue to be at the expense of coal, which is used in only 52 per cent. of the merchant fleet.

It is shown by Mr. Cuthbert Maughan, in Chapter VIII., that 1934 was a year of great significance for British shipping by reason of the Government recognition of the need of financial assistance. The factors which led up to the announcement of a subsidy by the President of the Board of Trade on July 3, 1934, and the reception of it, are reviewed, and reference is made to the difficulty in the

Trans-Pacific trade caused by the competition of highly-subsidised American ships which enjoy a monopoly of the San Francisco-Honolulu trade and at the other end of the voyage compete in the passenger and cargo trade between Australia and New Zealand.

Mercantile marine machinery is again reviewed by Mr. R. J. Butler, who refers to the hope that the new Government schemes for assisting the tramp and trawler industries will accentuate the demand for rejuvenating measures. Mention is made of the application of Diesel-electric drive to paddle wheels, with chain transmission from the motors to the wheels ; applications of Diesel-electric and turbo-electric drive ; and the Voith-Schneider system of propulsion. No developments of powdered coal-firing are to be observed in this country, but some work has been done in Germany. The plain reciprocating engine is still favourite for the general run of mercantile tonnage, with the exhaust steam turbine as a popular fuel-saving adjunct. There was a distinct revival in the internal-combustion engine ; figures of power for Great Britain increased more than four times. The lack of apprentices and its evil is referred to.

The survey of "Notable Merchant Ships of the Year" begins appropriately with the Queen Mary, but naturally the keen interest taken in the French liner Normandie is referred to. There are also some "general utility" liners, the novel ships of the Isherwood Arcform design, and others constructed to Maierform design. Steamers built for Chinese service have special structural arrangements to combat piratical attacks. Cross-Channel vessels include the new Southern Railway train ferries for a new service between Dover and Dunkerque. Several interesting motor coasters have been introduced into the British coasting trade. Smaller types of vessel include many powerful tugs, a trawler reputed to be the fastest in the world, a yacht and research vessel. A few oil-tankers were built during the year.

With the reduced establishment of the active Navy, the strength and efficiency of the Royal Naval Reserve becomes increasingly important. Mr. F. E. McMurtrie gives an historical survey of this force and of its work during the War. The more intimate contact of War service helped to improve the relations between R.N. and R.N.R. officers. In 1932 about 44 per cent. of R.N.R. officers were embarked for training ; in 1933 about 41 per cent. The percentage of men going afloat for training was between 38 and 39. Mr. McMurtrie is able to show that the R.N.R. to-day affords good value for the comparatively small sum which it costs.

#### AIR SECTION.

The first chapter in the new Air Section deals with the Fleet Air Arm, in which progress has been sustained in technique rather than in numbers. Compared to the naval air forces of other Powers, British naval air strength has fallen to a very low point, and the Fleet Air Arm is "at barely half its proper strength." Reviewing personnel requirements, it is suggested that non-commissioned pilots and

observers might be employed, as in the R.A.F., to reduce the now heavy requirements of officers. An important innovation in 1934 was the introduction of an aircraft (the Shark) to combine the functions of torpedo bomber and spotter reconnaissance aircraft. Another innovation was the appearance of a new small amphibian flying-boat, the Seagull V. Improvements in the operation of aircraft from carriers and ships are described, and it is shown how flying has been made far more independent of adverse weather conditions than formerly.

There is a complementary chapter on Foreign Fleet Air Arms, which is of necessity largely statistical. The Naval Air Service of the United States is by far the most powerful in the world. Next comes that of Japan, which by 1938 may consist of 1,000 aircraft. The estimates for naval aviation in France show a substantial increase, largely for re-equipment. The Italian aviation authorities have carried the development of the flying-boat farther than any other nation. Notes are given concerning the naval air forces of the smaller Powers, and in particular that of Holland, the efficiency of which is commended.

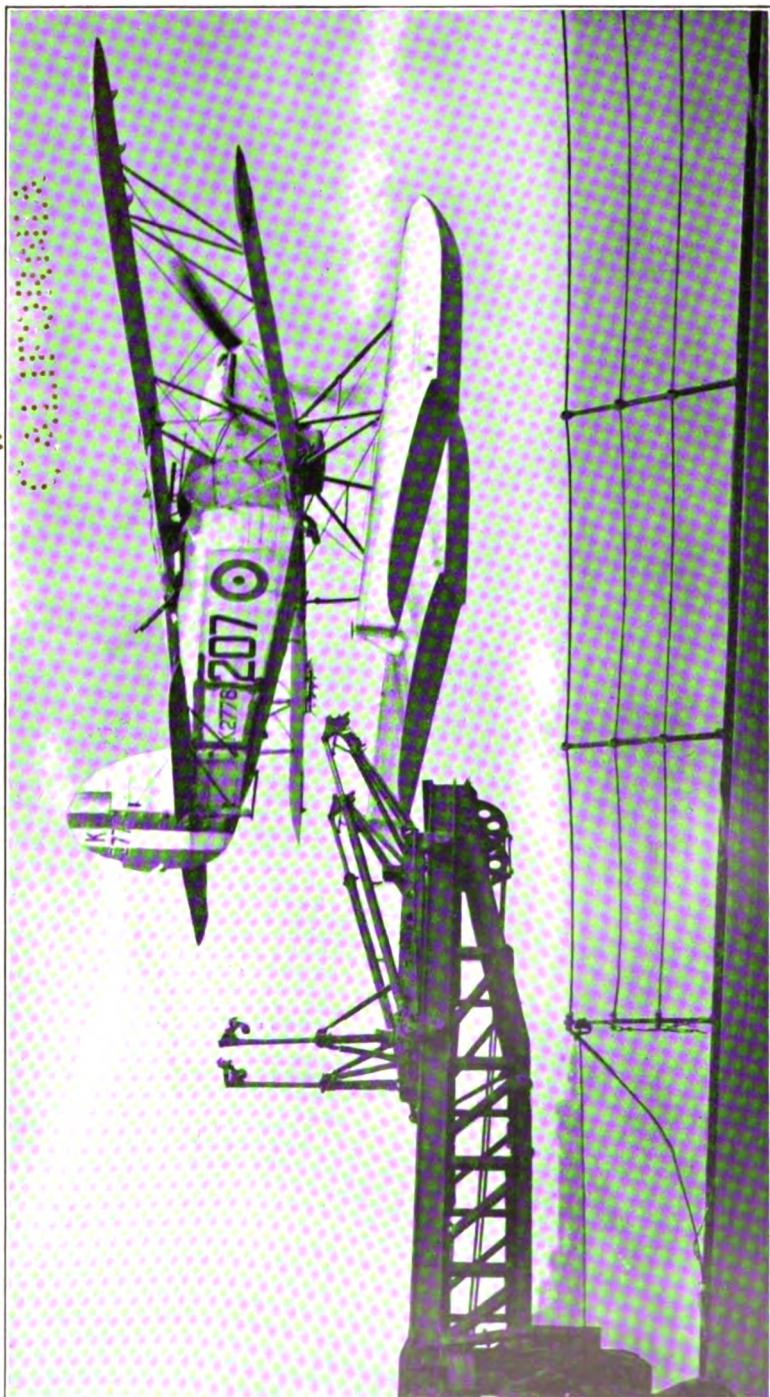
Mr. Leonard Bridgman, who writes on Civil Aviation, shows how this is inextricably connected with military aviation. A healthy aircraft industry is the most important asset to a country forced to concern itself with air transport and air defence. On the question of higher speed in air liners, it would be impolitic to hinder the progress of civil aviation by saddling it with responsibilities that are definitely not its own. Progress in 1934 is reviewed, and some of the more notable aircraft designs are described, including the "Comet," which made the Mildenhall to Melbourne flight in less than three days. The Vickers "Vellox" provides the only example of a British aeroplane designed to be used for either military or civil purposes.

## **NAVAL SECTION.**





JUN 19, 1942



HAWKER OSPREY SEAPLANE BEING CATAULATED.

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## CHAPTER I.

### NAVAL FORCES OF THE BRITISH EMPIRE.

DURING 1934 the situation in regard to the Royal Navy changed for the better. Not only did the Government recognise the gravity of the risks which had been incurred by so many years of retrenchment, but steps were taken towards reducing those risks. The change of policy involved in the alteration made in November, 1933, in the cruiser programme of that year, to provide for the construction of larger and more powerful vessels, foreshadowed what must be done to restore some measure of the country's strength at sea. This change was followed in March by an increased naval programme, with provision for 32,200 tons of cruisers as compared with the 23,200 tons in the programme of 1933. It was hoped that more would be done as the financial situation permitted. Mr. Baldwin said in the House of Commons on May 18, 1934, that the plans for the defences of the country were complete, and were reviewed every year :—

They were being proceeded with at the very slow pace which the present economic condition of the country permitted. If it became necessary or vitally important to the defences of the country, and if the clouds were threatening, their preparation could be speeded up, but it was rather economic considerations to-day than want of preparation that delayed progress.

Fortunately, the Budget surplus revealed by Mr. Neville Chamberlain, Chancellor of the Exchequer, in April, facilitated the task of the Government when they decided to make good some of the deficiencies in the defences of the country. Mr. Chamberlain himself, speaking at Birmingham on July 7, said that "Now that, under the National Government, our national finances were on their way to complete restoration, the Government would not be doing its duty if it did not begin the task of filling up some of the gaps in our defences which had appeared during the last ten years." Three months later in a speech at Edgbaston, Mr. Chamberlain said :—

This Government has given long and anxious consideration to this problem, and we have come to the conclusion that in a world where no one has disarmed, but where others are continually increasing their armaments, we must now embark on a programme which will mean a very considerable increase in the number of our air squadrons available for home defence, and which will involve the making good of some of the deficiencies which have been allowed to accumulate in some of our other forces.

In various speeches during the year, Sir Bolton Eyres Monsell, the First Lord, has driven home the necessity of restoring the naval forces if they are to play their former part in helping to keep the peace of the world. The following may be quoted from a speech he made at Trent Park on September 8, 1934 :—

Nobody could say that this country had not given a lead to the rest of the world. We had reduced our armaments to the point of risk to do so. Every other great

country had increased the cost of its armaments during the last eight years, some by over 100 per cent. It was quite impossible to go on disarming alone, and any Government which suggested that we should go on with unilateral disarmament would be guilty of criminal neglect of the interests of the country.\*

The Prime Minister, on his return from Newfoundland, kept his first public engagement on October 25, when he addressed the Peace Society at the Guildhall. In his speech he said :—

The movement for peace must be international ; the negotiations for peace must be international. There was no nation which, when the history of these last years came to be written, would be held up in history as the nation that gave an example by deed more than the nation to which we belonged. We had cut our arms. In international politics, the nation's policy had been a policy of peace. After the three signatures were put to the London Naval Treaty by the United States, Japan, and this country we strove by night and main to make that treaty more general than it was. *We gave an example.* We could have gone in for more building in accordance with the treaty. Geneva was working, and the representatives of peace were busy at Geneva. *We decided that we would wait.* Our purpose, deliberately set before us, was to show what the example of one nation would mean in the general advance of disarmament towards peace. We stuck to our guns—to use a military phrase.

We did not budge until the conclusion was written plain before us that the example of one nation alone was not going to advance peace very quickly. *Assuming potential aggressors, a vulnerable nation with great possessions, whether for its good or evil, unarmed to defend itself if need be, might be an element in the creation of war rather than a contribution to the peace spirit and practice of other nations.* But there was this further consideration—that when disarmament ended in rather heartbreaking insufficient conclusions they did not give up ; when thrown back at one point they went forward at another.

When everything was considered in all its possibilities, disarmament would never produce great results until the pacific statesmen of the world had produced more confidence, more good will, and a more fervent desire for peace.†

#### THE DANGER OF PACIFISM.

At the Guildhall Banquet on November 9, Mr. MacDonald admitted that the Government were disappointed with the Disarmament Conference, and that the outlook was not so good as many of them had hoped for. As to British commitments, he spoke as follows :—

The existence of the League of Nations imposes certain responsibilities upon us. . . . These obligations will be fulfilled. Were they not, the risk of war would be greatly increased, not diminished. But I ask you to believe that the Government is determined not to increase these obligations in a wanton or quixotic way, and certainly not without the knowledge and sanction of Parliament. It has no such added burdens in mind. *Some of the most ardent pacifists, when dallying with pure ideas and abstract faiths, are the most war-spirited advisers in foreign policy I have ever known.* I have heard them blame us for not taking steps which, in a brief time, would dot our country with State munition factories, turn the League of Nations into an armed camp, and bring us into conflict with other nations swiftly and surely ; and we are blamed for not doing those things by people who wish to protect women and children against war ! That is not how the foreign policy of this Government will be conducted.

According to the calendar, the time has come for reopening the books of the Washington and the London naval agreements. . . . The three of us—Japan, the United States, and ourselves—desire an agreement which will not jeopardise the safety of any of us, and which will not deprive us of the power of defence which we must maintain.

These extracts all serve to show how the pendulum has swung back from an over-confident optimism in regard to the outcome of the retrenchment which had been effected in the British armed forces. Reductions have led us nowhere, and not only admirals and members of the Government, but other keen observers have

\* *The Times*, September 10, 1934.

† *The Times*, October 26, 1934.

given expression to this fact during the past year. As Mr. H. G. Wells wrote in the second volume of his "Autobiography": "Peace will have to be kept—forcibly. For ages." Similarly, the Bishop of Fulham (whose work among continental chaplaincies takes him into twenty-two countries of Europe), preaching at an Armistice service in the Royal Exchange on November 12, said that he did not believe that at the present time we could dispense with armed forces. "Nations must be able to defend themselves against aggression, and we must resort to force sometimes in the honourable fulfilment of international obligations."

Ways and means whereby the Royal Navy should be restored to its proper strength have been the subject of some discussion. In regard to the financial problem, Admiral of the Fleet Sir Roger Keyes, M.P., advocates a national defence loan. Speaking at a civic banquet at Portsmouth, he said:—

It was quite obvious that if we were to replace our old cruisers and have an adequate Air Force the expenditure would be enormous, and he thought it was not fair to any generation that it should fall on the yearly Budget. It was obvious that it could not be done in the yearly Budget. Therefore he ventured to make the suggestion of a Defence Loan. He could think of no other solution. He had been talking of it during his visit to Canada and America, and there were millions of patriotic people in the Dominion ready to subscribe to such a loan and take a low rate of interest. He had met Americans who would assist a British loan of that kind, and he thought the idea of the loan should be talked about in this country.\*

The desirability of a large loan for naval defence was frequently discussed during the expansion which marked the years immediately preceding the War, but was always rejected. Even when the great Naval Defence Act of 1889 was passed, there was no loan to cover the cost of the work, but a middle course was chosen. The Act authorised the expenditure of a sum of £21,500,000 for the purpose of building, arming, equipping, and completing for sea a total of seventy vessels within a period of 4½ years. Of this expenditure, a sum not exceeding £10,000,000 was issued out of the Consolidated Fund, in seven equal annual payments up to March 31, 1896, to be refunded by extra taxation. The remaining £11,500,000 was issued out of the ordinary Navy Estimates during the five years ending March 31, 1894. The expenditure on ships built in the Royal Dockyards was roughly £11,500,000, and therefore equalled the addition to the ordinary naval votes, while the £10,000,000 taken from the Consolidated Fund was approximately equal to the sum spent in shipbuilding in the private yards. The public therefore knew that the money raised by extra taxation came back to the tax-payers in the form of wages and profits.

#### BRITISH ARMAMENT RESOURCES.

A great part was played in this effort to restore naval strength forty years ago by the British shipbuilding and armament firms, and in the same way whatever is done now will only be possible with the co-operation of such firms. During the past year a good deal of ill-founded criticism, apparently inspired by the inquiry into the arms traffic in the United States, has been directed towards the

\* *Naval and Military Record*, November 15, 1934.

private munition manufacturers, yet the fact remains that our naval power is largely dependent upon the maintenance of the first-class resources for production which such firms have provided in the past. The matter was dealt with in a speech by Mr. Ramsay MacDonald at Southampton on November 18, in which he said :—

If I could abolish armaments tomorrow, away they would go. But I cannot. I have got to accept armaments which I hope will diminish—and which I work day and night to diminish—and I will accept no defeat in that matter. But while they are there we have got to devise the best way to handle the problem. There are only two ways. One is to nationalise the whole of your armament production. That means that the State itself must build factories. Having built them, if we could manage it, those State factories would not have enough to do to keep them at work. That means State capital, which should be spent on social services, sunk in those factories, and staffs enlisted for irregular employment, with a tremendous increase in casual labour. That is not a proposition which any practical politician would countenance on any account whatever. The alternative is that which this Government is carrying out. We must control the trade. There are very few real armament firms, and the problem is not the production of armaments but the sale and export of them.\*

#### THE CAPITAL SHIP.

In the course of a debate in the House of Lords on the Defence Services on November 14, 1934, Lord Beatty asked if the Government believed that the battle fleet is vital for our safety, and if so, "what is going to be done towards replacing those war-worn vessels which were constructed and brought into being by the last generation ?" Lord Hailsham, who replied, said :—

The capital ship forms the essential element in the battle fleet upon which the whole structure of naval strategy depends. The capital ships we have to-day are, with very few exceptions, rapidly approaching the limit of their age and their efficiency, and the question of their replacement will have to be considered before very long.

Dominion co-operation must play an ever-increasing part in the maintenance of adequate British naval forces. Australia in 1934 agreed to take over and maintain a new cruiser, the Sydney, to replace the Brisbane, but as the new ship, under the London Treaty, must be reckoned as part of the British tonnage and not additional thereto her transfer means a relief in maintenance costs rather than an accession to total strength. New Zealand is also prepared to maintain two up-to-date cruisers in place of the Dunedin and Diomede. In contrast to these Dominions, which realise that the mastery in the Pacific is a question which vitally affects their welfare, no steps have been taken by Canada to supplement her flotilla of four destroyers and three minesweepers ; and in South Africa the sea-going naval force of the Union Government ceased to exist in 1934. The responsibility for financing and manning the ships upon which the security of British oversea communications depends is thus very unequally shared at the present time. Some important consultations took place, however, during 1934 which cannot fail to have served a useful purpose. Sir Maurice Hankey, in visiting Melbourne for the Centenary celebrations, was able to consult the authorities in Australia and New Zealand ; and in the naval conversations at Durban in July between the Admirals on the Africa and East Indies Stations, South African ministers were included.

\* *The Times*, November 14, 1934.

## I.—THE BRITISH NAVY.

### CONSTRUCTION COSTS.

In reply to a question in Parliament on June 13, 1934, Sir Bolton Eyres Monsell, the First Lord, stated that the cost per standard ton of the ships due for completion in 1933–34 was £216. The cost per standard ton of pre-War vessels of the same types and displacements was £115. There were many factors which had increased the cost of naval working hours since 1914, including higher wages, shorter working hours, increased cost of materials and greater complexity of ships and their equipment. The increase was therefore not greater than would have been expected. A certain article in the Press had given the figures as £244 and £50 respectively, concluding that the increase was 90 per cent., whereas in fact it is 90 per cent.

On July 6, 1934, Sir Bolton Eyres Monsell gave the following approximate figures of the annual cost for pay, victualling and clothing, repairs and other maintenance services of the latest types of battleship, battle-cruiser, destroyer and submarine: battleship Rodney, £303,000; battle-cruiser Hood, £274,000; cruiser Neptune, £133,000; destroyer Eclipse, £41,000; submarine Shark, £23,200. These figures show the total direct expenditure, i.e. exclusive of annual accruing liability for pensions.

### CRUISER CONSTRUCTION.

Fifteen cruisers were completed, continued, begun or authorised during 1934 for the British Empire, spread over the programme of five years, from 1930 to 1934 inclusive, which is indicative of the slow rate of progress made owing to the curtailment of the financial appropriations. The actual period of building of the "Leander" class, from laying down to commissioning for service, is 2½ years, but the period which elapsed between the authorisation and the laying down of some of the cruisers varied from one year and three months to two years and three months. An improvement in this respect was discernible during 1934, but there is still great delay between the time a ship is authorised and the time when her construction is actually begun.

The cruisers completed during 1934 were the Orion and Neptune, of the 1930 programme. Their progress was as follows:

	Authorised.	Laid Down.	Launched.	Commissioned for Service.
Orion . . .	July, 1930	Sept., 1931	Nov. 24, 1932	Jan. 16, 1934
Neptune . . .	" "	" "	Jan. 31, 1933	Feb. 24, 1934

They are sister ships to the Leander and Achilles, completed in 1933, and on an estimated tonnage of 7,000 they carry eight 6-in. guns, four 4-in. anti-aircraft guns, 21 smaller guns, and eight torpedo tubes. With geared turbines of 72,000 horse-power the designed speed is 32½ knots. Each vessel has a catapult and a Hawker

Osprey aircraft. The Orion was commissioned by Captain E. de F. Renouf, C.V.O., late Naval Attaché in South America, and the Neptune by Captain H. R. Moore, D.S.O., late Director of Plans, both for the Second Cruiser Squadron, Home Fleet, of which the Orion became flagship in December.

#### CRUISERS LAUNCHED.

Six cruisers were launched during 1934, three belonging to the much delayed 1931 programme (the Ajax, Arethusa, and Amphion), and three to that of 1932 (the Galatea, Sydney, and Apollo). The Ajax took the water at the Barrow works of Vickers-Armstrongs, Ltd., on March 1, when the naming ceremony was performed by Lady Chatfield, wife of the First Sea Lord. Speaking at the luncheon following the launch of the Ajax, General the Hon. Sir Herbert Lawrence, the Chairman of Vickers-Armstrongs, referred to the deplorable condition of the shipbuilding industry in this country, but noted that it was better than in the previous year. Whereas early in 1933 there were only five per cent. of the available berths occupied, at the time he spoke there was something like 20 per cent. occupied. Admiral Sir Ernle Chatfield took advantage of the occasion to make some apt remarks upon the position of the private armament firms. He said :

There were some—very few—who would say that the Navy, for instance, instead of depending as it did now on a combination of State and private factories, should trust only to State factories. That view had been very easily controverted in Parliament, and had also been explained to be quite impossible and futile by the very able letters written to the newspapers a few weeks ago by those great industrialists Lord Weir and Sir John Thornycroft, who clearly explained that it was almost impossible to define in a great firm where work and experiment for industry ended and where the similar experiment and work for weapons commenced. They could not distinguish between the two. One ran into the other. But there was another reason why this mistaken idea, I think, had so much arisen in these days when everyone was trying to get disarmament. It was the fashion of the moment, the noble idea to try and reduce the weapons in the world. Anything which was called an armament firm naturally appeared to be totally opposed to that principle.

It was a great mistake that great factories of that type had to be called armament firms. To my mind it is a misnomer. What they ought to be called is national defence factories. After all, they are for our defence. The firm of Vickers-Armstrongs is just as much part of our national defence as the Ajax or the batteries at Portsmouth Harbour. It could not be said that a firm whose task it is to make the shield on which the security of our Empire and of these islands depends is an aggressive one. On the contrary, it is one that should be respected as a great national defence industry.

The Ajax was the fourth and last ship of the "Leander" type. She is due to commission for service in April, 1935, to replace the York in the South America Division.

Of the other five cruisers launched during 1934, the Amphion, Apollo, and Sydney belong to what is called the "modified Leander" type, although in all essential particulars they are similar to the Leander; the modifications apply chiefly to the arrangement of the machinery. The Amphion was launched at Portsmouth Dockyard on July 27, the naming ceremony being performed by the Marchioness of Titchfield. On completion in 1935 the Amphion will join the Africa Station as flagship. The Apollo was launched at Devonport Dockyard on October 9, when the naming ceremony

was performed by Lady Florence Boyle, wife of the Commander-in-Chief, Home Fleet.

The Sydney, which was launched from the Wallsend shipyard of Swan, Hunter and Wigham Richardson, Ltd., on September 22, was formerly known as the Phæton, under the 1932 shipbuilding programme for the Royal Navy. In May, 1934, it was agreed with the Commonwealth Government, who had been negotiating for a new cruiser to replace the Brisbane, that they should take over the Phæton for service in the Australian Navy, and her name was changed to Sydney, to perpetuate the services of the previous cruiser of that name which, in 1914, destroyed the Emden. The naming ceremony was performed by Mrs. Bruce, wife of the High Commissioner for Australia, the Right Hon. Stanley Bruce, who was also present. Speaking after the launch, Mr. Bruce said that Australia recognised that her safety depended upon the sea, and that the British Navy was the bulwark for the peace they all ardently desired.

As the cruiser strength of the Royal Australian Navy is counted as part of that of the British Empire quota under the London Naval Treaty, no new vessel can be built for the Royal Navy in place of the Sydney.

The remaining two cruisers launched in 1934 were the Arethusa (1931 programme) and Galatea (1932 programme). These are the first of a new type of small cruiser, the building of which has subjected the Admiralty to a good deal of criticism. On a displacement of 5,200 tons, the new vessels will carry six 6-in. guns. The horse-power is 64,000 and the designed speed 32½ knots. The lead towards smaller dimensions and power which this implies has not been followed abroad, for the cruisers laid down by other Powers since the Arethusa was begun have the following characteristics : United States, 10,000 tons, fifteen 6-in. guns ; Japan, about 8,500 tons, fifteen 6-1-in. guns ; France, 7,600 tons, nine 6-1-in. guns ; Italy, 6,791 tons, eight 6-in. guns. The "Arethusas" are even smaller and less powerful than the cruisers which Germany has built since the War in accordance with the Versailles Treaty, and which are of 6,000 tons, armed with nine 5-9-in. guns.

The Arethusa was launched at Chatham Dockyard on March 6, 1934, when the naming ceremony was performed by Lady Tyrwhitt, wife of the late Commander-in-Chief at the Nore, Admiral Sir Reginald Tyrwhitt, who flew his broad pennant during the War in the former Arethusa. The Galatea was launched at the Greenock shipyard of the Scotts Shipbuilding and Engineering Company on August 9, when the naming ceremony was performed by Lady Alice Shaw-Stewart, wife of Sir Hugh Shaw-Stewart, Lord Lieutenant of the County of Renfrew.

#### CRUISERS LAID DOWN.

The three cruisers laid down during 1934 were those of the 1933 programme, the Penelope, Newcastle, and Southampton. As was recorded in the "Annual" for 1934, there were to have been four

cruisers in this programme, one of the "Leander" class of 7,000 tons and three of the "Arethusa" class of 5,200 tons; but in November, 1933, owing to developments abroad, it was decided to substitute for these ships two cruisers of a new type of about 9,000 tons, with increased armament, and one cruiser of the "Arethusa" type. The aggregate tonnage of the three ships which are being built will amount to about the same as that of the four which it had originally been decided to build.

The contract for the Penelope was awarded on February 5, 1934, to Messrs. Harland and Wolff, Belfast. Her keel was laid on May 30, 1934, by the Duke of Gloucester in the course of his visit to Ulster. This is the first ship to be built by Harland and Wolff for the Royal Navy since the War.

The award of the contracts for the two 9,000-ton class cruisers was announced by the Admiralty on May 1, 1934. The Southampton will be built by John Brown and Co., Ltd., at Clydebank. The Newcastle will be built by Vickers-Armstrongs, Ltd., but only the machinery will be constructed at their Barrow naval construction works. The hull is being built at the naval yard at Walker-on-Tyne, which had been closed for 3½ years, since the completion of the steamship Monarch of Bermuda. The yard was opened at the end of September, 1934, and the keel of the new cruiser was laid on October 4.

Although official particulars of the new type have not been disclosed, it is believed that there will be four turrets disposed on the centre line as in the 7,000-ton cruisers of the "Amphion" class, but with three 6-in. guns instead of two in each turret. The Southampton will be nearly 80 ft. longer than the Amphion, with corresponding increase in breadth and draught.

In reply to a question in Parliament on November 26, 1934, the First Lord announced that the naming of ships of the "M" class, which it was originally intended to name after mythological monsters, had been under review, and the King had approved a proposal that ships of this class should be named after cities. The Minotaur and Polyphemus were accordingly renamed the Newcastle and the Southampton. The name Southampton has been substituted for Minotaur as the class name for vessels of this type.

#### CRUISERS AUTHORISED.

Under the 1934 Navy Estimates, four cruisers are to be built, three of the new "Southampton" type and one of the "Arethusa" type. The former will be called the Birmingham, Glasgow, and Sheffield. The Birmingham will be built at Devonport Dockyard, with machinery by John Brown and Co., Ltd., Clydebank; the Glasgow by Messrs. Scotts Shipbuilding and Engineering Co., Ltd., Greenock; and the Sheffield by Vickers-Armstrongs, Ltd., Walker-on-Tyne, with machinery at Barrow. The cruiser of the "Arethusa" class will be named the Aurora, and will be built at Portsmouth Dockyard.

#### AIRCRAFT-CARRIERS.

The principal difference between the 1934 construction programme and that of the previous year is the inclusion in the former of an aircraft-carrier. Such a ship was projected in the Estimates of 1929-30, but her construction was deferred for further experience with existing carriers. At length, as the First Lord said in his speech on the 1934 Estimates, it has come to be recognised that the construction of a vessel of this type could not much longer be delayed. Of the six aircraft-carriers that we possess to-day, three were experimental types and according to modern requirements no longer have the speed necessary for a craft of this sort. Neither have they the power to operate the number of aircraft of the modern carrier. The Director of Naval Construction, Sir Arthur Johns, K.C.B., C.B.E., in a paper on "Aircraft-Carriers" at the Institution of Naval Architects on March 21, 1934, showed that the Furious, with a flush flight deck and horizontal funnel ducts, takes 35 aircraft as compared with 50 on her sister ships the Glorious and Courageous, each of which is fitted with an "island" through which pass the funnel uptakes and mast, and from which navigation is effected. The Eagle has about 21 aircraft and the Argus and Hermes 15 each. The largest carriers in use are the U.S. Lexington and Saratoga, each fitted for 80 aircraft.

The new British carrier will be called the Ark Royal, and will be built by contract.

#### FLOTILLA LEADERS.

After three years (1928 to 1930 inclusive) during which the naval programmes each included a flotilla leader of similar displacement, speed and gun-power to the destroyers with which they were to work, a return was made to the former practice of building leaders slightly faster and better armed than contemporary destroyers. Under the 1931 programme there was built the Exmouth, to work with the destroyers of the "Eclipse" type. The latter are of 1,375 tons, 36,000 horse-power, 35½ knots, and armed with four 4·7-in. guns, seven smaller guns, and eight torpedo tubes. The Exmouth is of 1,475 tons, 38,000 horse-power, 36 knots, and armed with five 4·7-in. guns, seven smaller guns, and eight torpedo tubes. Her keel was laid in May, 1933, in dock at Portsmouth, and she was formally named in dock on January 31, 1934, by Lady Kelly, wife of Admiral Sir John Kelly, Commander-in-Chief. The Exmouth was completed on October 31, 1934, and commissioned next day, with the crew of the Wallace, which she relieved in the 5th Flotilla, Home Fleet.

The Faulknor (1932 programme) is of similar type to the Exmouth. She was laid down in July, 1933, by Yarrow and Co., Ltd., and launched on June 12, 1934. The Faulknor is due for completion in March, 1935, and is to replace the Campbell in the 6th Flotilla Home Fleet. Messrs. Yarrow are also building the Grenville (1933 programme), ordered in January and laid down on September 29, 1934.

The leader of the 1934 construction programme will be called the Hardy, after Nelson's great friend and flag captain, and will be built by Cammell Laird and Co., Birkenhead.

#### DESTROYERS.

The eight destroyers of the 1931 programme ("Eclipse" class) were laid down in March, 1933, and launched between January and April, 1934. They were built in from eighteen to twenty months. The first to be commissioned was the Escapade (built by Scotts', Greenock), on September 3, 1934, to replace the Walker. Next came the Electra (built by Hawthorn Leslie and Co., Hebburn-on-Tyne), on September 17, to replace the Vimy; and after her the Esk (built by Swan Hunter, Wallsend-on-Tyne), on October 2, to replace the Velox. During October and November, the other five of the class replaced the following ships: Echo (Denny) in place of Warwick; Eclipse (Denny) in place of Watchman; Encounter (Hawthorn) in place of Vortigern; Escort (Scotts') in place of Versatile; Express (Swan Hunter) in place of Wessex.

The eight destroyers of the 1932 programme ("Fearless" class) were laid down between May and July, 1933, and launched at various dates between May 12 and October 11, 1934. They are due to be completed by March, 1935, to relieve the vessels of the Sixth Flotilla, Home Fleet. The entry of these two classes into service will make an appreciable difference to the flotillas in home waters. Only five of the 27 leaders and destroyers in the three Home Fleet flotillas during the combined exercises in March, 1934, were within the age limit of their class; three-quarters of them, that is to say, were obsolete. With the arrival of the "Eclipse" and "Fearless" types, there will only remain four over-age destroyers in the Fleet, one half of the Second Destroyer Flotilla.

The "Eclipse" and "Fearless" types are replicas of the "Duncan" class, built under the 1930 programme. On a displacement of 1,875 tons, they carry four 4·7-in. guns, seven smaller guns, and eight torpedo tubes. With 36,000 horse-power, the designed speed is 35½ knots, but on trial the "Eclipse" class made an average of 36·7 knots. The radius of action is given unofficially as 6,000 miles at economic speed, which, as was said at the launch of the Fury at Cowes on September 10, makes such a destroyer virtually a cruiser.

Vessels of the 1933 destroyer programme (the "Greyhound" type) were ordered in January, 1934, from the following firms: Greyhound and Griffin, Vickers-Armstrongs, Ltd., Barrow-in-Furness; Garland and Gipsy, the Fairfield Shipbuilding and Engineering Co., Ltd., Govan; Gallant and Grenade, Alexander Stephen and Sons, Ltd., Glasgow; and Grafton and Glowworm, John I. Thornycroft and Co., Ltd., Southampton. The keels were laid in August and September.

The Admiralty announced the allocation of the contracts for the leader and destroyers of the 1934 programme on October 12, 1934, or three months earlier than the corresponding date for those



(Photo by Wright and Logan, Southsea.)

**H.M. FLOTILLA LEADER EXMOUTH.**

*Commissioned at Portsmouth, November 12, 1934.*



(Photo by Wright and Logan, Southsea.)

**H.M. MINESWEEPING SLOOP HALCYON.**

*Commissioned at Portsmouth, April 17, 1934.*

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of the 1933 programme. The leader will be built by Cammell Laird and Co., Birkenhead. Two destroyers each will be built by W. Denny and Bros., Ltd., Dumbarton; Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne; Scotts' Shipbuilding and Engineering Co., Ltd., Greenock; and the Parsons Marine Steam Turbine Co., Ltd., Wallsend-on-Tyne. Hulls of the vessels allocated to the Parsons Company will be built by Vickers-Armstrongs, Ltd., at Walker-on-Tyne. The names allotted to these vessels are Hasty and Havock (Denny); Hunter and Hyperion (Swan Hunter); Hostile and Hotspur (Scotts); and Hero and Hereward (Parsons and Vickers).

The destroyer depot-ship Woolwich, authorised in the 1932 programme, was laid down by the Fairfield Shipbuilding and Engineering Company, at Govan, in May, 1933, and launched on September 20, 1934, when Mrs. Euan Wallace, wife of the Civil Lord of the Admiralty, performed the naming ceremony. The Woolwich will be of 8,750 tons, and except for a small defensive armament of 4-in. guns, will be virtually a floating workshop. She should be ready for service in the autumn of 1935, and is intended to replace the Sandhurst in the Mediterranean, which ship is worn out.

#### SUBMARINES.

The submarines completed during 1934 were the three of the 1931 programme (Severn, Sealion, and Shark), and two of the three of the 1932 programme (Clyde and Salmon). The Severn, the second ship of the ocean-going "Thames" class, was built in the creditable period of one year and eight months by Vickers-Armstrongs, Ltd., at Barrow. Her keel was not laid until March 27, 1933, she was launched on January 16, 1934, and completed in November, 1934. The Severn was the 162nd submarine built at Barrow. Details of her type were given in the 1934 edition of the "Annual," but it may be said that the Severn is slightly heavier than the Thames (1,850 tons instead of 1,805 tons on the surface, and 2,710 tons instead of 2,680 tons submerged), and while her engine-power is the same (10,000 above water and 2,500 submerged), she is designed for  $22\frac{1}{4}$  knots on the surface instead of  $21\frac{3}{4}$  knots. On the other hand, she mounts one 4-in. gun instead of one 4·7-in., with two smaller guns and eight torpedo tubes as in the Thames.

The Sealion and Shark are slightly heavier than earlier vessels of the "Swordfish" or "coastal" type (670 tons instead of 640 on the surface, and 960 instead of 935 tons submerged), and their length is 6 ft. more (193 instead of 187 ft.), but otherwise they have the same characteristics. The Sealion was laid down on May 16, 1933, launched on March 16, 1934, and completed on December 21. The Shark was laid down at Chatham on June 12, 1933, launched on May 31, and completed at the end of December.

The building period of the Severn was repeated in the case of the Clyde, first submarine of the 1932 programme. Laid down at the Barrow works of Vickers-Armstrongs on May 15, 1933, she was launched on March 15, 1934, and should complete in February, 1935.

Her dimensions are identical with those of the Severn. The possession of three of these large, fast submarines, with wide radius of action, will add appreciably to the potency of the British First Submarine Flotilla in the Mediterranean, hitherto composed mainly of the "Rainbow" type.

The Salmon, seventh ship of the "Swordfish" class, was laid down by Cammell Laird and Co., on June 15, 1933, at Birkenhead, launched on April 16, 1934, and completed at the end of the year. Her sister vessel, the Snapper, allocated to Chatham Dockyard, was not laid down until September 18, 1933, launched on October 25, 1934, and should be completed about June, 1935.

The 1933 submarine programme included two mine-laying submarines similar to the Porpoise, built under the programme of 1930. The Narwhal was laid down by Vickers-Armstrongs, at Barrow, on May 29, 1934, and the Grampus, at Chatham Dockyard, on August 20, 1934. They will take longer to build than the vessels of the two previous programmes, and may not be ready for service until 1936.

The three submarines of the 1934 programme will include one minelayer ("Porpoise" class) to be called the Rorqual, to be built by contract; and two of the "Swordfish" class, the Spearfish, to be built by contract, and the Sunfish, to be built at Chatham Dockyard.

#### SLOOPS.

During 1934 the four sloops of the 1931 programme entered service. They included two of the "Grimsby" type for overseas service and the first two of the new "Halcyon" type for minesweeping duties in home waters. The Grimsby was commissioned on May 15, 1934, for service in China in place of the Cornflower, while the Leith was commissioned on July 10 for service in New Zealand in place of the Veronica. On the same displacement as earlier vessels of the repeat "Shoreham" type (1,060 tons) the "Grimsby" class carry two 4·7-in. guns instead of two 4-in., and also have one 3-in. anti-aircraft gun as well as smaller guns.

The "Halcyon" class of minesweeping sloops are smaller, and in them a reversion has been made to reciprocating engines for propulsion instead of geared turbines. The Halcyon was commissioned on April 17 and the Skipjack on May 8, to relieve the Pangbourne and the Dundalk respectively in the First Mine-sweeping Flotilla. Both were built by John Brown and Co., Ltd., Clydebank. The displacement is 875 tons. With engines of 1,770 horse-power the designed speed is 16½ knots. The oil-fuel capacity is 220 tons—60 tons less than that of the "Grimsby" type. The engines fitted in the Halcyon and Skipjack are of the compound Uniflow type fitted with poppet valves and cam valve gear. They are operated under a system of totally enclosed forced lubrication.

The 1932 programme of sloops was a repetition of that of 1931, with two vessels of the "Grimsby" type, the Lowestoft and Wellington, and two of the "Halcyon" type, the Harrier and Hussar. The

two former were laid down at Devonport Dockyard, the Lowestoft on August 21, and the Wellington on September 25, 1933 ; they were launched on April 11 and May 29, 1934, and when commissioned for service about the end of the year were to relieve the Bridgewater in China and the Laburnum in New Zealand. The Harrier and Hussar were ordered from Thornycroft and Co., Ltd., Southampton, and laid down by them on July 11 and August 10, 1933, and launched on April 17 and August 27, 1934. They were due for completion in November, 1934, and January, 1935, respectively, to join the First Minesweeping Flotilla.

Further development in sloop design took place under the 1933 programme, in which five vessels of the class were sanctioned. The Londonderry and Deptford were ordered to be of the "Grimsby" type, and were laid down at Devonport on June 11 and at Chatham on April 30 respectively. They will enter service about September, 1935, for duty overseas. One vessel, the Speedwell, was ordered to be the fifth ship of the "Halcyon" type of minesweeper sloop. She was laid down in June, 1934, by Messrs. W. Hamilton and Co., Ltd., Port Glasgow—the first ship built for the Navy by this firm since the War.

The other two ships of the 1933 programme marked new departures. One will be a coastal sloop, the Kingfisher, and was laid down by the Fairfield Shipbuilding and Engineering Co., Ltd., Govan, on June 1, 1934. The other will be what is called a "convoy sloop," and was laid down on March 9, 1934, by John Brown and Co., Ltd., Clydebank. The name of Bittern was chosen for her, but in September, 1934, when it was decided to pay off the Admiralty yacht Enchantress for sale, as she was worn out, the Bittern was ordered to be renamed Enchantress, and in addition to performing her normal duties she will be made available for occasional use by the Board of Admiralty for inspections of naval ports and visits to the Fleet as may be required. It has been stated unofficially that the "Enchantress" type will be armed with 6-in. guns.

Under the 1934 programme there are to be built two general service sloops, two sloop-minesweepers, and two coastal sloops. The general service sloops ("Grimsby" class) will be called the Aberdeen and Fleetwood, and will be built by contract. The sloop minesweepers ("Halcyon" class) will be called the Niger and Salamander, and will be built by contract. The coastal sloops ("Kingfisher" class) will be called the Mallard and Puffin, and will be built by contract.

#### MISCELLANEOUS CRAFT.

The netlayer authorised in the 1934 programme to be built by contract will be called the Protector ; the surveying ship will be known as the Stork ; and other vessels in the programme are the Dowgate and Ludgate, boom gate vessels ; Dunnet, boom working vessel ; Dwarf, submarine school tender ; and Basset, trawler.

The river gunboat Robin, laid down in April, 1933, by Messrs. Yarrow and Co., Ltd., at Scotstoun, was commissioned at Hong-Kong on July 23, 1934, for service in the West River Flotilla, by

Lieutenant-Commander A. St. C. Donald. She replaced the Moorhen, which had been in service since 1901 and was beyond economical repair. The Robin is of a type mid-way between the Sandpiper, of 185 tons and 11½ knots, and the Falcon, of 372 tons and 15 knots, although, like them, she is armed with one 3·7-in. howitzer and nine smaller guns. Her displacement is 226 tons, and with reciprocating engines of 800 horse-power she has a designed speed of 12½ knots.

#### THE ADMIRALTY BOARD.

The administration at the Admiralty during 1934 enjoyed the benefit of continuity in the higher posts. Only one change occurred on the Board, on April 28, when Vice-Admiral C. M. Forbes was relieved as Third Sea Lord and Controller by Vice-Admiral R. G. H. Henderson.

At the request of the First Sea Lord, Sir Oswyn Murray, who has been Permanent Secretary of the Admiralty since 1917, and was formerly Assistant Secretary from 1911, has consented to serve as Permanent Secretary beyond the normal age for retirement until the later part of 1936. Sir Vincent Baddeley, Deputy Secretary since 1931, and formerly First Principal Assistant Secretary from 1921, has consented in similar circumstances to serve as Deputy Secretary until the end of 1935.

Sir Charles Walker, who retired from the post of Deputy Secretary in 1931, published his reminiscences, "Thirty-six Years at the Admiralty" (Lincoln Williams), in 1934.

#### STABILISATION OF PAY.

The principle of consolidated rates of pay for officers, instead of the former principle of standard rates which were liable to revision in relation to fluctuations in the cost of living, was adopted in August, 1932, but deferred for final consideration of the rates until April, 1934. It was then further deferred, and eventually it was announced in Fleet Order 1935, dated August 30, 1934, that the Government had decided, as from September 1, 1934, that the rates of pay of officers should be consolidated at 9½ per cent. below the standard rates of 1919, which corresponds with the cost of living index figure of fifty-five. This is the same index figure as that on which the remuneration of the Civil Service was consolidated in July, 1934.

But the new consolidated rates are not yet payable in full. The order of August 30 states that "until the state of the national finances permits of the issue of the consolidated rates in full they will be subject to an abatement, and officers will continue to be paid at the current rates." The current rates are those which have been in operation since July 1, 1934, when a partial restoration of the 1931 cuts in pay was made throughout the public service. Until July 1, 1934, the pay of officers was 11 per cent. below the standard rates; from July 1, it has been 10 per cent. below the standard rates.

#### SURPLUS LIEUTENANT-COMMANDERS.

The special scheme for the retirement with pension of surplus lieutenant-commanders and senior lieutenants was closed for voluntary retirements on August 31, 1934. Up to that date, a total of 183 officers had taken advantage of the scheme, the special feature of which was that it gave opportunities to younger and more junior officers than earlier schemes to retire at ages at which there were more chances for them to adopt other careers. In addition to this scheme of retirement with pension, another special scheme for retirement with gratuities for lieutenants and lieutenant-commanders under 40 was inaugurated on January 1, 1934, for one year. It offered to certain officers not covered by the former scheme retirement with a lump sum gratuity. It further offered to those who were covered by the existing scheme the option of retirement on gratuities instead of the annual rate of retired pay for which the former scheme provided. The gratuities offered were : lieutenant-commanders (under 40), £2,500, with an addition of £200 for each year's seniority in the rank of lieutenant-commander ; lieutenants (confirmed in that rank on June 30, 1934), £1,000 up to three years' seniority as lieutenant, £1,200 on attaining three years' seniority, and £200 for each further year's seniority. It was open to officers promoted from the rank of mate, and transferred from the R.N.R., as well as to ex-cadets, but not to those from warrant rank or on the supplementary list.

#### ENGINEER PROMOTIONS.

During 1934 the zones of promotion for the selection of officers for promotion to engineer captain or captain (E) and engineer commander or commander (E), were as follows : Engineer Captain and Captain (E)—8–11 years' seniority as Engineer Commander or Commander (E) inclusive on the dates on which the promotions were made, viz., June 30 and December 31. Engineer Commander and Commander (E)— $2\frac{1}{2}$  years' seniority and over as Engineer Lieutenant-Commander or Lieutenant-Commander (E) on the dates on which promotions were made, viz., June 30 and December 31. These zones are to continue until further orders.

#### DARTMOUTH ENTRIES.

Entries into the R.N. College, Dartmouth, are now being made at an average rate of 40 cadets per term, or 120 a year. In October, 1934, the Admiralty communicated with the headmasters of preparatory schools on this subject, and agreed to publish in advance the number of vacancies that would be offered each term. It appears that there had been some misapprehension in the minds of parents or guardians and of headmasters concerning the position of Dartmouth. Possibly the agitation in Parliament and elsewhere that it should be done away with, on the ground of expense, and that all cadets should be taken from the public schools, had had a

disturbing influence in this respect. At any rate, many suitable candidates refrained from coming forward in the belief either that the vacancies at the College had been so reduced as to be almost negligible, or else that there were large and arbitrary fluctuations in the numbers admitted in successive entries. Neither assumption was, of course, true. Dartmouth continues to be the main channel of entry to the commissioned ranks so far as executive and engineering officers are concerned. More than three times as many officers enter by it than by the special entry scheme. During the period while the surplus of senior officers was being disposed of, new entries had to be rigidly curtailed. Recently they have averaged 33 per term. Now that conditions are returning more nearly to the normal, larger entries can be accepted, and until further notice, provided that suitable candidates continue to present themselves, an average of 40 per term will be taken.

Details of the examinations and conditions of entry by the various methods now open will be found in the half-yearly "Appendix to the Navy List," published by H.M. Stationery Office, price 1s. 6d.

#### THE FLEET AIR ARM.

Since January 1, 1933, a number of naval pilots of the Fleet Air Arm, who also hold rank in the Royal Air Force, have been promoted to Squadron Leader in that Force. Formerly only officers for specialist or ground duties had attained this rank. As regards promotion to Flight-Lieutenant, R.A.F., of naval and marine officers attached to the R.A.F. for service in the Fleet Air Arm, the Admiralty notified in Fleet Orders on May 24, 1934, that the number of such promotions must depend on requirements from time to time; but so far as the position in the immediately succeeding years can be foreseen, it is anticipated that a proportion approaching 50 per cent. of the naval and marine pilots coming forward for consideration in these years will be promoted. Lieutenant-Commanders, R.N., who were attached to the R.A.F. for service in the Fleet Air Arm before May 15, 1933, and who fail to obtain promotion to the rank of Squadron Leader, R.A.F., will revert permanently to naval general service on attaining six years' seniority as lieutenant-commander.

The conditions under which naval officers serve as pilots and observers in the Fleet Air Arm were described in a special article in "Brassey's Annual," 1931. Pilots are attached to the Royal Air Force and are given an R.A.F. commission in addition to their naval commission to ensure their status and authority under Air Force Law. Observers are not attached to the R.A.F.

#### SUBMARINE SALVAGE.

An important decision with regard to the saving of life from a sunken submarine was communicated to the House of Commons by the First Lord on March 12, 1934. After exhaustive and anxious consideration the Admiralty came to the conclusion "that the raising of a submarine in time to save life by that means is not a

feasible operation, and that the only practical as well as the most certain method of saving life is by the Davis submerged escape apparatus, which is now fitted to all submarines." For the future it is proposed to rely only on this for saving life. A demonstration of its value in the case of an actual disaster was given when the Poseidon was lost in 1931. On the other hand, there were the negative results obtained after many months' arduous and gallant work in the attempt to raise M.2 in 1932. The United States Navy has come to exactly the same conclusion. For instruction in the Davis escape apparatus, there is a tank in use at Gosport, and others are being provided at Hong-Kong and Malta.

#### THE HYDROGRAPHIC SERVICE.

The Report of the Hydrographer of the Navy, Captain J. A. Edgell, for 1933, which was issued for publication on May 14, 1934, again showed the world-wide scope and value of the work of British surveying ships, of which eight were employed, four in the waters off the British Isles ; one on the west coast of Africa and the Palestine coast ; one off the south coast of China, the east coast of Malaya, and the west coast of Borneo ; one round Cyprus and in the Persian Gulf ; and one in the West Indies and along the coast of Labrador. Altogether, 694 miles of coastline were surveyed, and 3,610·5 square miles of ocean sounded. During 1933 an extensive tidal stream survey of the waters around the British Isles was begun in co-operation with Trinity House and the French and Netherlands authorities. It is expected to take four years to complete.

#### UNIFORM CHANGES.

A few minor changes in the uniform regulations were made during the year. On August 16 it was announced that their Lordships had decided, with the King's approval, that in future with No. 3 (frock coat with epaulettes) dress and white trousers, white shoes should be worn on board, and, weather permitting, on shore, both in home waters and abroad. Wellingtons or half-Wellingtons will continue to be worn in bad weather on shore. Formerly the regulations provided for white shoes with this dress only outside home waters.

A change was made in August in the shape of the time-honoured black silk handkerchief of seamen, which by many people is fondly but quite erroneously supposed to be connected with the death of Nelson. The existing square pattern handkerchief was replaced by an oblong pattern, 50 in. by 12 in. For use the ends were ordered to be stitched together in such a position as to form a loop of suitable length for the wearer, and the silk then folded in the usual way. It was anticipated that the new shape would be found more convenient and would provide more alternative positions in wear.

Miniatures of medals and decorations, formerly worn "on breast," were ordered on August 9, 1934, to be worn in future on a bar on the left lapel of ball dress and mess dress, extending over the

lapel towards the shoulder if necessary ; they are not to extend beyond the lapel on the inner side. Ribbons of miniatures are similarly to be worn on the lapel of mess undress jackets.

No. 4 dress is in future to be worn by officers receiving visits of ceremony from governors, diplomatic officers of and above the rank of Charge d'Affaires, foreign officers or other foreign functionaries. Visits will continue to be paid in No. 3 dress.

#### ROYAL NAVAL MEDICAL BRANCH CHANGES.

Changes came into effect on May 1, 1934, in the conditions for officers of the Royal Naval Medical Service, following the recommendations made in the previous year by the Fisher Committee on the Medical Branches of the Defence Forces. At the same time, new conditions were introduced in the R.A.M.C. and the R.A.F. Medical Branch. All entries are now made on a short service basis for candidates (preferably between 24 and 28 years of age) for three years, to be extended to five years at Admiralty discretion. At the end of three years' service they may retire with a gratuity of £400, but those who serve for five years will receive £1,000. After five years, permanent commissions will be given to selected officers who wish to make the Medical Service their permanent career. The number of specialist posts carrying increased emoluments was increased from 60 to 83, and increased facilities granted for post-graduate study. The age of retirement was increased for surgeon-commanders from 50 to 55, and for surgeon-captains from 55 to 57, thus affording officers the prospect of a longer career on full pay. The number of surgeon-captains was increased from 20 to 33. Some increases of pay were also granted. In the Navy List of June, 1934, and subsequently, officers qualified as specialists are indicated in the seniority list by abbreviations, such as (S)—surgery, and (O)—ophthalmic.

#### THE PHYSICAL TRAINING BRANCH.

In February, 1934, the Board decided upon certain changes in the training of officers in P. and R.T. (A chapter on this subject, by Captain R. L. Burnett, O.B.E., Director of Physical Training and Sports, appeared in the 1934 edition of "Brassey's Annual.") The object of the changes is to provide officers generally with increased facilities for acquiring a knowledge of the recreational side of P. and R.T. By this means, their Lordships hope that eventually the majority of ships will carry at least one officer who is conversant with this important subject. The two months' preliminary P. and R.T. course was abolished. In its place, a short course of four weeks' duration was instituted, to be held three times a year during Home Fleet leave periods (possibly more frequently should it be found necessary and practicable). This course is open to executive officers of not more than five years' seniority as lieutenant ; to lieutenants, R.M. ; and to junior (E) officers. These officers will normally be lent from their appointments for this purpose. Officers who undergo this course will not be required to specialise in P. and

R.T. and may volunteer for other specialist branches. Selections to specialise in P. and R.T. will be made from volunteers who have undergone the short course, and officers thus selected will undergo a three months' course.

#### SIGNAL BRANCH REORGANISED.

A reorganisation of the Signal and Telegraphist branches came into operation on January 1, 1934, following the report of an Admiralty Committee on the subject. The recommendations of this committee, based on reports from flag and senior officers, indicated clearly that higher technical qualifications with increased responsibility were required. The changes involved the introduction of non-substantive rates of pay, and placed the prospects of pay of the signalmen and telegraphists on an equivalent basis with those of the seaman branch. New titles for the non-substantive ratings were introduced, and in March it was announced that badges had been approved for these ratings as follows :

Visual signalman, 1st class, crossed flags, crown above, star below ; 2nd class (C.P.O.'s and P.O.'s), crossed flags, crown above ; 2nd class (other ratings), crossed flags, one star above, two stars below ; 3rd class, crossed flags, one star above, one star below ; trained operator (V/S), crossed flags, star above ; signalman, not T.O. (V/S), ordinary signalman and boy, crossed flags.

Wireless telegraphist, 1st class, wings, crown above, star below ; 2nd class (C.P.O.'s and P.O.'s), wings, crown above ; 2nd class (other ratings), wings, star above, two stars below ; 3rd class, wings, star above, star below ; trained operator (W/T), wings, star above ; telegraphist (not T.O. W/T), ordinary telegraphist and boy telegraphist, wings.

#### WARRANT RANK PROMOTIONS.

Reductions in recent years have served to slow up considerably the rate of advancement to warrant rank, but now that the personnel is beginning to expand again after touching "rock bottom" it is hoped that conditions will improve in this respect. In June, 1934, it was notified that the Board had had under consideration the regulations for promotion to warrant mechanician, to which no promotions had been made since 1926. These regulations, which constitute the normal channel of promotion to warrant rank open to the stoker branch, have thus been inoperative in practice, and to remedy this unsatisfactory state of affairs it was decided to provide for a proportion of the vacancies at each future examination for warrant rank in the engine-room branch being reserved for mechanician candidates. Such candidates will be regarded as eligible for promotion to warrant mechanician provided they have reached a sufficiently high standard in the professional examination and are otherwise qualified. The proportion of vacancies reserved will not normally exceed 10 per cent.

#### SERVICE MARRIAGES.

During the past year the first marriages in Service chapels have taken place under the Marriage (Naval, Military, and Air Force

Chapels) Act of 1932, which provided that certain banns of marriage may be published and certain marriages may be solemnised in Service chapels licensed under the Act. A list of the naval chapels so licensed was published in Fleet Orders on March 29, 1934. One of the parties to a marriage in a Service chapel must be serving in the Regular Forces, or in reserve forces actually called out or embodied, or the daughter of a person so qualified. In addition, one of the parties to the marriage must have the ordinary residential qualification in the parish in which the chapel is situated, unless the marriage is by special licence.

#### THE NATIONAL MARITIME MUSEUM.

An important event of 1934 was the passing into law of the National Maritime Museum Act, whereby the long-cherished dream of a museum in Great Britain devoted entirely to naval and nautical affairs was realised. The Act received the Royal Assent on July 25, 1934, and by a coincidence the annual meeting of the Society for Nautical Research, which had been so intimately concerned with the project, was held on the same day. At the meeting, Admiral Sir George Hope, the Chairman, said that the new museum, which would in time be the most remarkable institution of its sort in the world, would be accommodated not only in the Queen's House at Greenwich but in all the buildings recently vacated by the Royal Hospital School.

The cost of adapting and equipping the vacant school buildings for the museum, estimated at £29,000, has been very generously defrayed by Sir James Caird, who has thus added another to his former liberal benefactions in this field, which included £65,000 towards the restoration of the Victory. The first Board of Trustees of the Museum is as follows : Earl Stanhope, Chairman ; Mr. R. C. Anderson, Admiral of the Fleet Earl Beatty, Sir William Berry, Sir James Caird, Captain H. F. David, Admiral Sir George Hope, the Earl of Ilchester, Sir Frederick Kenyon, Sir Percy Mackinnon, Admiral Sir Herbert Richmond, and Mr. Walter Runciman.

The post of first Director of the Museum was offered to and accepted by Professor Geoffrey Callender, a most worthy choice, since he has been identified more than anybody else with, and largely responsible for, the creation of the Museum. The appointment is a fitting recognition of the indefatigable nature of his labours. On taking up the post, he was succeeded as Professor of History and English at the Royal Naval College, Greenwich, on September 12, 1934, by Professor M. A. Lewis, who had previously held a similar position at the Royal Naval College, Dartmouth.

#### NAVAL CANTEEN SERVICE.

The sum of £4,147 6s. 8d. was available for distribution in August, 1934, in respect of the surplus revenue accruing to the N.A.A.F.I. from naval canteen trading during the year ending October 28, 1933. In accordance with the men's wishes, two-fifths

of this sum, £1,658 18s. 8d., was allocated to the Royal Naval Benevolent Trust. A sum of £300 was allotted to the Union Jack Club, and the balance divided among the various commands for distribution for the improvement of recreational facilities and the like, as might be decided within each command.

#### NAVY WEEK SUCCESS.

The success of Navy Week, 1934, held from August 4 to 11, inclusive, was very gratifying, the more so as it had appeared to some that "saturation point" had been reached in past years and that the difficulties of getting into and about the dockyards might deter visitors from coming again. But the Navy Week Committees, whose work was co-ordinated for the first time from the Admiralty under the direction of Rear-Admiral F. L. Tottenham, spared no effort to improve the amenities and the facilities at the ports, and they had their reward in the increased attendance.

All records were broken at Portsmouth, the aggregate attendance being 155,098, as compared with 127,083 in 1933, an increase of 28,015. The previous highest aggregate was 149,245 in 1931. At Plymouth, the aggregate was 75,785, the third largest figure since the inception of Navy Week—87,393 people attended in 1929, and 80,195 in 1930; the figure in 1933 was 60,089. A record was established for the number of cars at Plymouth, of which there were 4,552, as compared with 3,483 in 1933. There can be no doubt that the dissemination of a knowledge of the Navy in this way is a very desirable thing at the present time.

An audited statement of the Navy Weeks' Charities Fund for 1933, published in Fleet Orders on March 29, 1934, showed that the net receipts were £12,875 19s. 3d., of which £10,024 12s. 3d. was allocated to the men's charities through the Royal Naval Benevolent Trust; £2,506 3s. to officers' charities; and the remainder in grants to dockyard and police hospitals and orphanages.

#### THE ROYAL MARINES.

The age limits for first appointments in the Royal Marines were widened for the June, 1934, and subsequent examinations. They are now 17½ to 19½ years, instead of 18 to 19 years as formerly. Examinations are held in June and November each year by the Civil Service Commissioners.

On the night of August 12–13, 1934, the Metropolitan Police ceased to be responsible for police duties at Devonport Dockyard, and this change completed the transfer of such duties from this force to the new Royal Marine Police. The latter had already been substituted at Portsmouth, Chatham, Sheerness, and Rosyth Dockyards, at Portland naval base, and at the victualling yards, etc. The number of Royal Marine Police authorised in the 1934 Estimates is 884, as compared with 865 in the previous year.

The appointments of superintendent and chief inspector, Royal Marine Police, will in future be filled at Admiralty discretion either

by promotion of officers serving in the Royal Marine Police or by the appointment of officers on the active list or retired list of the R.N. or R.M. Officers on the active list will be required to retire on appointment, and officers on the retired list will be subject to medical examination.

Applications may now be made by long-service pensioners of the Royal Navy (seamen, stoker, and regulating branches) and of the Royal Marines, who are in possession of the long-service and good conduct medal and are under 45 years of age, to be enlisted in the Royal Marine Police for duty in dockyards and Admiralty establishments at home. The number of vacancies arising annually is limited, and is estimated at about sixty.

#### RECRUITING.

It is satisfactory to learn that recruiting for the Royal Navy and Royal Marines continues to be satisfactory. The First Lord has stated that only one in fourteen of the men who want to join the Service to-day can be taken. In September, 1934, the rate of entry through the recruiting offices was as follows :

Boys, 51 per week ; stokers, 2nd class, continuous service, 36 per week ; Royal Marines, 60 per month ; ordinary seamen (special service), 812 per quarter ; ordinary telegraphists (special service), 15 per quarter ; ordinary signalmen (special service), 10 per quarter ; engine-room artificers, 4th class, 40 per quarter ; sick berth attendants (probationers), 35 per quarter ; assistant cooks, 49 per quarter ; assistant stewards, 28 per quarter ; blacksmiths, 4th class, 8 per quarter ; painters, 4th class, 4 per quarter.

The number of pensioner recruiters was increased from 51 to 56 in the 1934 Estimates owing to the larger numbers to be recruited. Colonel A. S. Cantrell, R.M., who had been Director of Naval Recruiting for four years, retired at his own request on September 1, and was succeeded by Lieutenant-Colonel J. M. Tuke, O.B.E., of the Plymouth Division.

## II.—DOMINION NAVIES.

### THE ROYAL AUSTRALIAN NAVY.

In May, 1934, the Commonwealth Government, who had been negotiating for the acquisition of a 7,000-ton 6-in. gun cruiser of the "Leander" class to replace the *Brisbane* (completed in 1916), agreed to take over the *Phæton*, which had been laid down as a unit of the 1932 construction programme on July 8, 1933, by Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne. The *Phæton* was renamed the *Sydney*, after the previous cruiser of that name which destroyed the *Emden*, and she was launched on September 22, 1934, when Mrs. Bruce, wife of the High Commissioner for Australia, performed the naming ceremony.

The centenary of the State of Victoria which was celebrated in

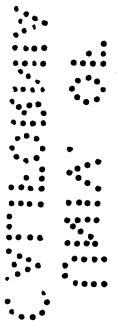


(Photo by Frank and Sons, South Shields.)

H.M. AUSTRALIAN CRUISER SYDNEY.

Launched at Wallsend-on-Tyne, September 22, 1934.

(By courtesy of the builders, Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne.)



October, 1934, brought together an interesting gathering of warships at Melbourne. In addition to the vessels of the Australian Navy, there were present the cruiser Sussex, Captain S. S. Bonham-Carter, D.S.O., which had brought the Duke of Gloucester from England; the New Zealand cruisers Dunedin and Diomede, the former flying the flag of Rear-Admiral F. Burges Watson, D.S.O.; and the sloop Hindustan, of the Royal Indian Navy. Three Short Rangoon flying boats of No. 203 (F.B.) Squadron of the Royal Air Force also flew from Basra.

#### THE ROYAL CANADIAN NAVY.

Commodore Walter Hose, C.B.E., retired from the position of Chief of the Naval Staff, Department of National Defence, Ottawa, on January 1, 1934. He was succeeded by Captain P. W. Nelles, R.C.N., the first Canadian-born officer to succeed to this post. He entered the Royal Canadian Navy with the first term of cadets in 1908-09 at the age of 16.

Paymaster Commander G. A. Youle, O.B.E., R.N., relinquished the post of Naval Secretary at the Ottawa headquarters on May 1, 1934. He was succeeded by Paymaster Lieutenant-Commander M. J. R. O. Cossette, R.C.N., the first Canadian naval officer to hold this position. The new Secretary was a journalist before joining the Royal Canadian Navy as a seaman in 1911. Later he transferred to the writer branch, with which he served during the War, and was promoted to warrant rank in 1917 and to commissioned rank in 1919.

The Royal Canadian Navy is a closed service to a much greater extent than other Dominion forces. All the commands, and most of the staff positions, are held by Canadian officers, and there is less interchange between the R.N. and R.C.N. than is the case with other oversea services. The Royal Navy, however, continues to train Canadian cadets.

#### THE ROYAL INDIAN NAVY.

The principal event of the past year in regard to the Oversea Naval Forces was the inauguration of the Royal Indian Navy as a result of the passing into law of the Indian Navy (Discipline) Act, which gave the full status of a navy to the Royal Indian Marine. This Act was passed by the Indian Council of State at Simla on September 6, 1934. It provides that the discipline of the Force shall be regulated, like that of Dominion Navies, by the British Naval Discipline Act, suitably amended to meet local conditions. This has replaced the Indian Marine Act of 1887, which had become out of date and was limited in its scope to Indian waters. The Bill was first before the Indian Legislature in 1928, when it was thrown out by one vote, not because there was a majority against it in principle, but because members were desirous of making a gesture to show their objection to the rule under which the Indian Naval and Military Services were reserved from the control of the Legislative

Assembly. The administrative task of reconstruction on a combatant basis therefore proceeded in anticipation of the passing of the measure into law.

On October 1, 1934, the King-Emperor was pleased to approve that the Royal Indian Marine should henceforth be designated "the Royal Indian Navy," and he wished every success to the force in its new rôle. The Governor-General in Council appointed Tuesday, October 2, 1934, as the date on which the Indian Navy (Discipline) Act should come into force. From that date, the designation of the Flag Officer Commanding and Director, Royal Indian Marine, was altered to "Flag Officer Commanding the Royal Indian Navy." Officers, warrant officers, and ratings serving in the R.I.M. became officers, warrant officers and ratings of the R.I.N. with the rank and seniority that they held in the R.I.M. The Admiralty, in congratulating the Flag Officer Commanding on the new status of the force under his command, said that they welcomed it "as a happy augury for the future" and were confident that it would "inspire officers and men to develop still further the fine tradition so long maintained by the Royal Indian Marine."

The formal inauguration took place at the Bombay headquarters at noon on October 2, when, in the presence of detachments, Vice-Admiral Sir Humphrey T. Walwyn read the Order of the Day and the reply he had sent to the King-Emperor. Salutes of 31 guns were fired at midday by ships of the Indian Navy and shore batteries at Bombay and Karachi. At the latter the salute was fired by the Cornwallis, sloop, and the King's message was read to the ship's company by Lieutenant-Commander H. P. Hughes Hallett. The senior engineer officer of the Cornwallis was the first Indian-born engineer officer of the R.I.M., Engineer Lieutenant Dijendra Nath Mukerji, who has become the senior Indian officer in the new Royal Indian Navy.

The new sloop Indus is completing for the Indian Navy by Hawthorn, Leslie and Co., Ltd., at Hebburn-on-Tyne. This vessel was launched on August 24, when the naming ceremony was performed by Lady Walwyn, wife of the Flag Officer Commanding. The Indus is of about 1,350 tons displacement, with a designed speed of 16½ knots. Her armament includes two 4·7-in. guns. The Indus is slightly heavier than contemporary sloops in the Royal Navy, and her construction has been specially adapted to tropical conditions.

The personnel of the Royal Indian Navy at the time of its inauguration was about 120 officers and 1,000 ratings. The effective force included one depot ship, the Dalhousie (flagship); four sloops, the Clive, Cornwallis, Hindustan, and Lawrence; two patrol boats, the Baluchi and Pathan; two surveying ships, the Investigator and Palinarus; and the target-towing trawler Madras.

Rear-Admiral Arthur E. F. Bedford, C.B., succeeded Vice-Admiral Sir Humphrey Walwyn as Flag Officer Commanding on November 16, 1934.

## NEW ZEALAND DIVISION, ROYAL NAVY.

The Report of the Commodore Commanding the New Zealand Station for the period ending March 31, 1933, dated on board H.M.S. Dunedin at Auckland, September 8, 1933, was issued in 1934. On the concluding date of the report there were 460 ratings on the active list who had been recruited in New Zealand, and 26 ex-Imperial ratings who had been accepted for permanent service in the New Zealand Division of the Royal Navy. The ships' companies were completed by 452 ratings loaned from the Imperial Service. Thus about one-half the enlisted personnel were New Zealanders and the remainder on loan. The report noted that the entry of ratings had been restricted for some time to the bare numbers necessary to keep the complements of ships and establishments complete, no margin being allowed for special courses of instruction, or for ratings being attached to the Imperial Service in order to obtain the wider experience so desirable. Petty officer G. R. Davis-Goff, appointed warrant officer on July 11, 1932, was the first New Zealand rating to be promoted to that rank. The strength of the R.N.R., New Zealand Division, on March 31, 1933, was : officers, 5 ; men, 233 ; and of the R.N.V.R., New Zealand Division : officers, list I, 61 ; list II, 17 ; men, list I, 576 ; list II, 381.

## SOUTH AFRICAN NAVAL SERVICE.

The South African Naval Service ceased to exist on March 31, 1934, when the minesweeping trawlers Immortelle and Sonneblom were paid off and handed over to the Royal Navy. On July 18, they were commissioned by Lieutenants H. J. Crossley and J. B. P. Stirling, from the cruiser Carlisle, for passage to England, and they reached Plymouth on September 26. Here they reverted to their former names of Eden and Foyle on being made available for service in the Royal Navy, from which they had been lent to South Africa in 1921.

Captain R. Penrose FitzGerald, R.N., retired, relinquished the post of Officer Commanding, South African Naval Service, in 1933, and in that year the surveying ship Protea was taken over by Simonstown Dockyard to be sold as a pleasure yacht. The hydrographical survey of South African waters is being continued by the Union Government by means of their fishery research ship Africana. Vessels of the Imperial Navy on the station now undertake the sea training of classes of the R.N.V.R. (South African Division).

The Navy League of South Africa in August, 1934, passed a resolution affirming that the Union can most effectively contribute towards the task of naval defence by facilitating the entry of South Africans into the Royal Navy in numbers to be agreed upon between the Union and British Governments, the Union contributing an annual sum, to be similarly agreed upon, which shall be proportionate to the number of South Africans employed in the Royal Navy under agreement between the respective Governments. A conference of

the League considered that it should be possible for the Union to maintain a body of at least 500 South Africans in the Royal Navy under such an agreement.

### III.—THE YEAR'S EVENTS.

It was announced in Parliament on November 7, 1934, by the First Lord, that as part of the Silver Jubilee celebrations King George hopes to review the Fleet at Spithead on Tuesday, July 16, or should the weather on that day be unsuitable, on Wednesday, July 17, 1935. The ships which are to take part in the Review will include, in addition to the Home and part of the Reserve Fleets, certain units of the Mediterranean Fleet. His Majesty, in the Victoria and Albert, will lead the Fleet to sea for exercises on the forenoon of the day following the Review.

In June, 1934, the Fleet in China added another to its list of rescues of people kidnapped by pirates. The s.s. Shuntien, belonging to the China Navigation Company, was seized by pirates between Taku and Chefoo on Sunday, June 17, 1934. The pirates looted the ship and escaped in junks, carrying off five British subjects, a Japanese, and twenty Chinese. The five British kidnapped included Lieutenants J. D. Luce, R.N., of the Osiris, and P. L. Field, R.N., of the Oswald, another passenger, and two officers of the Shuntien. On discovery of the capture, the aircraft-carrier Eagle, which was at Wei-Hai-Wei, proceeded to the vicinity, and search was made by her aircraft, which were fired upon from junks in a creek half a mile from the sea. The fire was returned, and the aircraft dropped a warning bomb and messages in Chinese threatening force if the prisoners were not surrendered. This had the desired effect, and by 6.30 p.m. on the 20th, the day the aircraft search had begun, the British captives were safe on board the destroyer Whitshed.

Boats from H.M.S. Suffolk, Captain Errol Manners, were able to take off 60 members of the crew of the British cargo steamer City of Cambridge, 7,058 tons, after they had been ashore for three days on the exposed south-east bend of the Pratas Reef, South China Sea, during a typhoon. The Suffolk went from Hong-Kong to the assistance of the vessel, and it was only after unavailing attempts to reach her in the rough sea that the rescues were effected.

### CRUISES DURING 1934.

The cruises of the Home Fleet followed very much the lines of earlier years. A contingent visited West Indian ports during the spring cruise, as happened in 1931 and 1932. It parted company at Arosa Bay on January 17 and returned to the Azores in the second week of March prior to the combined exercises. The contingent included the Nelson, Rodney, Malaya, Valiant, Leander, Achilles, and Furious, with the leader Kempenfelt and four "Crusader" class destroyers. During the summer cruise a contingent visited

Northern European ports, including three in Germany—Stettin, by the Leander; Kiel, by the Achilles; and Swinemunde, by the Fourth Destroyer Division.

The combined exercises in the Atlantic between the Home and Mediterranean Fleets, which began on March 10 and lasted for five days, are dealt with in a later chapter. The Admiralty Board made an inspection of the combined fleets at Gibraltar from March 20 to 23, and the Admiralty flag was hoisted in H.M.S. Bryony.

The squadrons overseas carried out normal cruising programmes on their respective stations. A feature of the year, however, was the inter-station visits which took place. The first was in connection with the conference of admirals at Singapore in the third week of January, 1934. The Commanders-in-Chief, China and East Indies—Admiral Sir Frederic Dreyer and Vice-Admiral M. E. Dunbar-Nasmith—were present in their respective flagships, the Kent and Hawkins. The Rear-Admirals Commanding Australian Squadron and New Zealand Division—Rear Admirals R. C. Dalglash and F. Burges Watson—also attended, proceeding to Singapore by passenger steamer.

After this conference, which ended on January 27, Admiral Dreyer transferred to H.M.S. Suffolk and made a cruise to Batavia, Sourabaya, Bali, Ende, and Port Darwin, where he arrived on February 24—the first time for many years that a Commander-in-Chief in China had visited Australia.

On July 2, 1934, Vice-Admiral Dunbar-Nasmith arrived in H.M.S. Hawkins at Durban, where he met the Africa Squadron under Vice-Admiral E. R. G. R. Evans, in H.M.S. Dorsetshire. South African ministers were consulted in the naval conversations which took place between the Commanders-in-Chief.

Among the cruises of individual ships was that of the cruiser Dragon which took her to Newport, Rhode Island, at the time of the yacht races for the America's Cup in September. Her officers and men were afforded special facilities by the American naval authorities for seeing the races from the U.S. men-of-war keeping the course clear for the yachts.

Sig<sup>n</sup>or Mussolini on September 14 paid an official visit to H.M.S London, Captain F. H. W. Goolden, flagship of Rear-Admiral J. K. im Thurn, which was at Venice. It was his first official visit to a British man-of-war.

The Mediterranean Fleet under Admiral Sir William Fisher, which was visiting Yugoslav ports at the time of the assassination of King Alexander of Yugoslavia at Marseilles in October, took the opportunity to meet the flotilla leader Dubrovnik with his body off Spalato on October 14, and rendered appropriate naval honours.

#### MISCELLANEOUS.

Another Expedition to the Antarctic was organised in 1934 by the Royal Geographical Society. The Admiralty co-operated by lending the services of Lieutenant R. E. D. Ryder, R.N., and Lieutenant (E) H. M. Millett, R.N., until about May, 1937, and

granting them full pay without allowances from naval funds ; the period of their service with the Expedition will count as full time for all Service purposes. Lieutenant Ryder had just returned from the China Station under sail. A description of the objects of this Expedition was given in *The Times* on June 7, 1934, by Admiral Sir William Goodenough.

Five naval officers who sailed home from the China Station arrived at Dartmouth on May 30, 1934, their voyage having taken just a year. They were Lieutenant-Commander M. B. Sherwood, from the aircraft-carrier Hermes ; Lieutenants G. S. Salt, R. E. D. Ryder, and P. S. Francis, from the submarines Oswald, Olympus, and Otus respectively ; and Surgeon-Lieutenant C. Ommanney-Davis, from the sloop Bridgewater. Their voyage was made in the ketch Taimoshan, 54 ft. by 12 ft., and they left Hong-Kong on June 1, 1933, proceeding via Japan and across the Pacific to California and the Panama Canal. In February they were shipwrecked at Crooked Island, Bahamas, where the ketch was driven ashore, but she was re-floated and repaired at Nassau.

An interesting ceremony indicative of the good comradeship between the Services took place at Goojerat Barracks, Colchester, on July 11, 1934, when Admiral Sir R. M. Burmester, who commanded H.M.S. Euryalus at the landing at Helles on April 25, 1915, presented the bell of that ship to the 1st Battalion of the Lancashire Fusiliers as a permanent memorial of the association of the Navy with the Battalion on that historic occasion. Lieutenant-Colonel R. M. Watson, commanding the Battalion, invited officers and men of the Euryalus at that date to attend as guests at the ceremony, thereby cementing still further the bonds of friendship existing between the ship's company and the Battalion.

The ship's bell of H.M.S. Canterbury was presented to Canterbury Cathedral on June 9, 1934, with appropriate ceremony, by the First Lord of the Admiralty at a special service for seafarers. Admiral Percy Royds, who commanded the cruiser during the War, inaugurated on this occasion a custom of striking six bells in prayerful memory of those whose lives are or have been spent afloat. Henceforth, at 11 a.m. every day, a retired or serving sailor will strike six bells in the Cathedral, just as a soldier of The Buffs turns a page in the Roll of Honour of that Regiment.

By order of Mr. Swanson, Secretary of the U.S. Navy, two destroyers of the American Fleet escorted the Aquitania into New York harbour on May 18 as a tribute to Admiral Sir Lewis Bayly, who was on board on his way to unveil a memorial plaque in the Naval Academy at Annapolis in honour of the late Vice-Admiral J. R. Pringle, U.S. Navy, who so effectively co-operated with the British naval forces after the United States entered the War. When the American destroyers arrived at Queenstown in 1917 Admiral Bayly treated them exactly like his own, and Captain Pringle became his U.S. Chief of Staff. The friendship fostered there in 1917-18 still flourishes between the two great English-speaking navies.

CHARLES N. ROBINSON,  
Commander, R.N.

## CHAPTER II.

### FOREIGN NAVIES.

THE most outstanding feature of 1934 as regards the navies of the principal Powers is the revival of interest in the capital ship, and renewed activity in the construction of that class of warship by those of the greater naval Powers which are not precluded by treaty from building new battleships. Far from the advent of aircraft and submarines rendering the battleship obsolete, as is so often and so ignorantly asserted, it is clearly recognised by the governments and naval authorities of all the Sea Powers that they are the basis of naval defence, as in our case they are of the whole system of Imperial security.

At the same time it is realised that new forms of attack call for new features in the construction and armament of the capital ship of to-day. It is here that those Powers which have subscribed to the London Treaty, and agreed not to lay down any ships of this class before 1936, are at a disadvantage in that they can only patch or "modernise" their old battleships in an endeavour to keep them up to date. This is a costly and unsatisfactory process, which, like constantly repairing an aged motor car, eventually ceases to be an economic proposition. Britain, the United States, and Japan have spent huge sums on tinkering with their old capital ships because they have agreed between themselves not to build new ones ; meanwhile those vessels are rapidly becoming not merely obsolete but definitely inferior in certain vital characteristics to the newly designed ships of France, Italy, and even Germany.

Curiously, it was the last-named Power which, as pointed out in the "Annual" of 1932, has brought about this position. Her 10,000-ton "Deutschlands" are so powerfully armed that no cruiser could stand up to them for a moment, and so fast that no existing battleship could bring them to action. In fact, the three British battle cruisers Hood, Renown, and Repulse—and possibly the Japanese "Kongo" class—are the only ships in the world which could compete with them. There will soon be four, and ultimately there may be six of these "Deutschlands."

France is now building two "Dunkerques." These 26,500-ton battleships will be faster than the "Deutschlands" and more powerfully armed than our Renown and Repulse ; therefore we shall only have one single ship, the Hood, to match them.

Italy has followed by building two 35,000-ton battleships which will unquestionably be as fast as the French ships and more powerfully armed. There will be no ships in the world able to bring them to action with any chance of success.

TABLE "A."—WARSHIPS COMPLETED, BUILDING, AND APPROPRIATED FOR DURING 1934.

NAVY.	Capital or Coast- Defence Ships.											
		Cruisers (Category A).		Cruisers (Category B).		Minelayers.		Destroyers.		Submarines.		
		Cruisers	Cruisers	Aircraft carriers.	Fleet leaders.	Sloops, etc.	Torpedo-boats, C.M.B.s, or Patrol Boats.	Gunboats.	Minesweepers, etc.			
British Empire *	..	..	11	..	3	24	9	14	..	..	..	
United States . . .	8	7	..	3	10	36	12	..	..	2	..	
Japan . . . .	..	4	1	..	..	12	9	..	4 <sup>1</sup>	..	9 <sup>2</sup>	
France . . . .	2	1	7	..	..	8	1	17	1	12	1	
Italy . . . .	12	6	..	..	..	4	18	..	4 <sup>3</sup>	..	..	
Germany . . . .	3	..	..	..	..	..	..	..	..	..	6	
Spain . . . .	..	2	..	..	4	..	..	..	..	..	..	
Denmark . . . .	..	..	..	..	..	..	..	1	3	..	..	
Greece . . . .	..	..	..	..	..	2	..	..	..	..	..	
Netherlands . . . .	..	1	..	..	..	..	6	..	..	..	..	
Norway . . . .	..	..	..	..	..	..	..	1 <sup>4</sup>	..	..	..	
Poland . . . .	..	..	..	1	..	..	..	..	..	..	4	
Portugal . . . .	..	..	..	..	..	4	3	3	..	..	..	
Sweden . . . .	..	..	..	..	1 <sup>5</sup>	..	2	3	..	..	..	
Brazil . . . .	..	..	..	..	..	9	..	1 <sup>6</sup>	..	..	..	
Colombia . . . .	..	..	..	..	..	2	..	..	..	..	..	
Peru . . . .	..	..	..	..	..	..	..	..	..	2	..	
Uruguay . . . .	..	..	..	..	..	..	..	..	3	..	..	
Persia . . . .	..	..	..	..	..	..	..	..	3	..	..	
Siam . . . .	..	..	..	..	..	2	..	..	3	..	..	
Total, exclusive of British Empire	7	11	25	2	4	22	72 <sup>7</sup>	68	7	32	5	19

<sup>1</sup> Torpedo boats of 527 tons.<sup>2</sup> Patrol craft.<sup>3</sup> Hangar cruiser.<sup>4</sup> The two destroyers acquired from Portugal by Colombia are shown under both countries.<sup>5</sup> Includes three small minelayers.<sup>6</sup> Minelayer and training ship.<sup>7</sup> Training ship.

\* Excludes vessels of the 1934 construction programme, viz. four cruisers, one leader and eight destroyers, one aircraft carrier, three submarines, five sloops, one netlayer, and one surveying ship.

It will be apparent, therefore, that in this vital matter we have seriously handicapped ourselves by subscribing to the clauses in the London Treaty relating to capital ships. At best we cannot rectify this mistake before 1939. The situation is far more serious for us than it is for our partners in the predicament—the United States and Japan—because this superiority in battleships relates to nearby neighbours with bases close on the flanks of our most important trade routes. Two of these neighbours are also greatly superior to us in the air, and very strong in torpedo craft and submarines. The situation in which Britain is placed by the amassing of these modern sea and air forces by rivals, however friendly, while our own have been neglected, can, therefore, only be described as most humiliating.

Whatever the future designs of battleships, it is clear that the 10,000-ton 8-inch cruiser has had its day. This unbalanced design with its very heavy armament and its weak shell-like hull is another ill-effect of the Treaties. The great naval Powers agreed to a maximum cruiser displacement which at once produced a call for the maximum number of guns of the largest permitted calibre which could be crammed into that displacement. The result has been the production of a class of ship which is so badly protected that a duel with her own kind would probably have the same result as a fight between two armed merchant ships—mutual annihilation. The type is too big for fleet work and needlessly large for convoy duties.

TABLE "B."—FOREIGN SHIPS BUILDING, ORDERED, OR COMPLETED DURING 1934 IN:—

Ordered by	GREAT BRITAIN.			FRANCE.	ITALY.			JAPAN.	U.S.A.
	Sloops.	Sub-marines.	C.M.B.s		Mine-layers.	De-stroyers.	Sub-marines.		
Manchukuo	..	..	..	..	..	..	..	2	..
Persia .	..	..	..	..	..	..	..	..	..
Peru .	..	..	..	..	..	..	..	..	2
Poland .	..	..	..	1	..	..	..	..	..
Portugal .	2	3	..	..	..	..	..	..	..
Rumania .	..	..	..	..	..	..	1	..	..
Siam .	..	..	3	..	2	..	..	..	..
Uruguay .	..	..	..	..	..	..	..	3	..

In the United States naval opinion still clings to the "biggest of everything" idea; but, given a free hand, other Powers would probably follow the British policy, which favours rather smaller and better-protected vessels.

The marked superiority of French and Italian flotilla leaders over British ships, nominally of the same class, is yet another ill-effect of the London Treaty and one which it is to be hoped will be abolished as the result of the negotiations to be entered into during 1935.

## UNITED STATES.

In spite of the parlous state of the country's finances, the Government of the United States is still pressing forward with its naval building programme. It has again shown its determination to attain "parity" with Great Britain by approving in principle construction up to the full extent permitted under the Washington and London Treaties. This policy was formally adopted when, in March, 1934, President Roosevelt signed the bill sponsored by Mr. Vinson, Chairman of the Naval Affairs Committee.

Although this Bill does not authorise actual expenditure, it allows Congress to consider the allocation of approximately \$750,000,000 spread over seven years to meet the cost of 102 vessels, including one aircraft carrier, four cruisers, sixty-five destroyers, thirty-two submarines, and 1,184 naval aircraft, which, it is asserted, is the force required to bring the fleet up to treaty strength. Meanwhile, financial provision has been made to lay down four 10,000-ton cruisers, one to be armed with 8-inch and the remainder with 6-inch guns, the total cost of which will be about \$68,000,000. This construction, together with the fifty odd ships already laid down, will, it is reported, entail expenditure of \$184,468,000 in 1935; \$92,778,000 in 1936; and \$19,871,000 in 1937, in addition to \$77,133,400 paid during the fiscal year ending June, 1934.

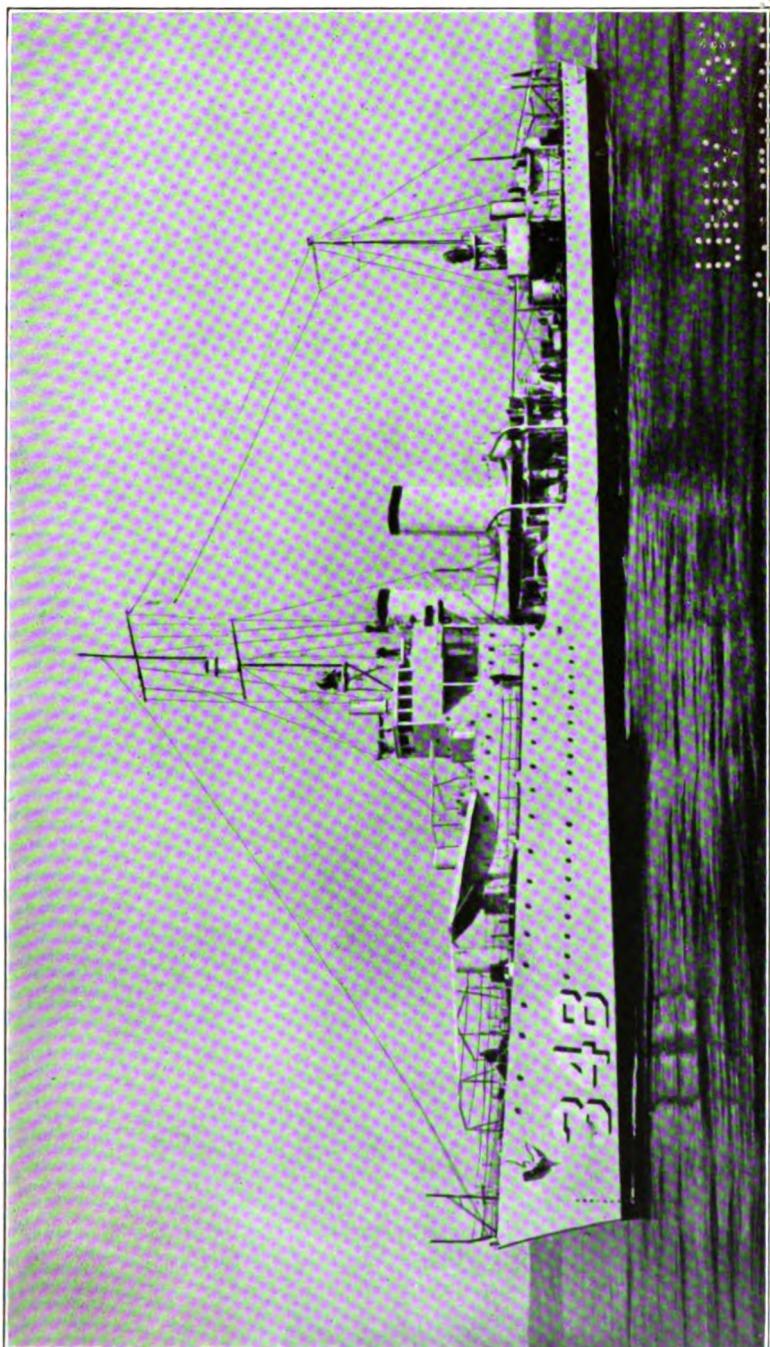
The Navy Department has also called for estimates for the construction of two leaders, twelve destroyers, and six submarines, and these will be laid down during the year ending June, 1935.

At the back of all this naval activity there are, clearly, two motives—the desire of the "big navy" party to have a fleet second to none, and the intention of the U.S. Government to use its programme as a factor in the bargaining preliminary to the forthcoming Naval Conference.

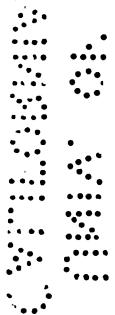
Semi-official opinion adheres strenuously to the contention that the United States must have big ships to offset its lack of bases and the superiority of Britain in the matter of "fast merchant ships capable of being armed." Japan's desire to improve her position in relation to her naval strength as compared with that of the United States, and incidentally Britain, is vigorously resented. This situation is not conducive to harmony or to progress towards a new naval agreement between the chief Powers; but it is possible that, ultimately, finance will have a moderating influence on American as on Japanese naval aspirations.

## BATTLESHIPS.

It is reported that the Navy Department is preparing designs for a new battleship, in readiness for the time when the embargo on capital ship construction, in force under the London Treaty, comes to an end. The design, it is stated, will embody a ship of 35,000 tons displacement specially armoured against "air and high elevation projectile attacks." Congress is to be asked to vote funds



THE U.S. DESTROYER FARRAGUT.  
*First Post-War Type Destroyer in the U.S. Navy.*  
Completed for Service, June 18, 1934.



so that construction can be begun at the earliest possible moment, i.e. December 31, 1936.

The Idaho, the last of the "New Mexico" class of battleships to be modernised, was due to complete this process before the close of 1934. The work included raising the elevation of the turret guns. The other two ships of the class—New Mexico and Mississippi—completed their trials after modernisation early in 1934. Admiral Standley, Chief of Naval Operations, opposed a proposal to modernise the California and Tennessee. It was more important, he said, to keep these battleships in commission.

#### CRUISERS.

Fifteen 8-inch 10,000-ton cruisers are complete and in commission. Five of these vessels entered service during 1934. In addition the Quincy is due to join the fleet in January, 1936, and the Vincennes in January, 1937. The last ship of this class to which the United States is entitled could not be laid down before January 1, 1935, but funds have already been appropriated for preparatory work. She will provide the full quota of eighteen of these ships completed by January, 1938.

The four 10,000-ton 6-inch cruisers Brooklyn, Philadelphia, Savannah, and Nashville have been laid down. They are all due for completion by the end of 1936; three more cruisers, probably of the same type, have been appropriated for. It was originally reported that one or more of these ships was to have a landing-deck; but Admiral Standley, in reply to questions on the subject before the House Committee on the Navy Appropriation Bill for 1935, stated that they had studied such a type but plans were not yet completed, and they preferred to put their money into cruisers which were needed and the use of which was known. It is understood that these four ships will carry fifteen 6-inch guns.

As the result of tactical and technical investigations, it has been decided that torpedo armaments in 10,000-ton cruisers are a mistake, because they could not be used effectively, and that they therefore merely constitute a source of danger to the ships. In consequence, torpedo tubes will not be fitted in any future vessels of the class, although they are still to be retained in smaller ships.

#### AIRCRAFT CARRIERS.

The aircraft carrier Ranger was commissioned in June last, the first regular landing on her deck being made by Rear-Admiral E. J. King, Chief of the Bureau of Aeronautics. Two new carriers, the Yorktown and Enterprise, have been laid down at Newport News. They will displace about 20,000 tons and are due for completion by the end of 1936 and early 1937 respectively.

#### LESSER VESSELS.

The Navy Department is making marked efforts to replace the rapidly wearing out destroyer flotillas by newer vessels. Eight

flotilla leaders and twenty-four destroyers are now under construction and will be completed by the end of 1936. In addition, there is the later programme of two leaders and twelve destroyers ; making ten leaders and thirty-six destroyers in all. The leaders are the first of a new class in the U.S. Navy. They will be vessels of about 1,850 tons armed with five 5-inch guns.

Of the new submarines, the Cuttlefish was commissioned in June 1934 ; the Cachalot joined the fleet earlier in that year ; the Shark and Tarpon are due for completion in 1935 ; and the Porpoise and Pike during 1936. The last four are craft of about 1,300 tons surface displacement ; the two former are slightly smaller. Six more are due to be laid down during the financial year.

There are also two gunboats of 2,000 tons—the Erie and Charles-ton—due for completion early in 1936.

#### ORGANISATION.

The organisation of the U.S. Navy for the fiscal year July, 1934–June, 1935 is based on the following ships being kept in full commission :—14 battleships, 15 heavy cruisers, 10 light cruisers, 72 destroyers (also 23 in rotating reserve), 54 submarines, 4 aircraft carriers, 5 minelayers, 1 airship. These, together with patrol vessels, auxiliaries, minesweepers, etc., make up a total of 306 ships.

The strength of the enlisted personnel is 82,500 men, made up of 57,294 in sea-going ships ; 3,043 with fleet aircraft ; 2,654 flag allowances, transit, sick, etc. ; 19,509 not afloat. This number will only provide 80 per cent. of full complements for battleships, cruisers, aircraft carriers, and minelayers. Submarines and various small craft alone will have full crews.

#### OFFICERS.

Some important changes in high commands took place during the early summer of 1934. Admiral Joseph M. Reeves has succeeded Admiral David F. Sellers as Commander-in-Chief, U.S. Fleet, and has been succeeded by Vice-Admiral Frank H. Brumby as Commander, Battle Force. Rear-Admiral Edward H. Campbell now commands the Scouting Force, and Henry V. Butler the Aircraft Carriers. There have been new appointments to nearly all the other sea-going commands.

Efforts are being made to accelerate promotion and to ensure that officers will reach the ranks of captain and rear-admiral sufficiently young to enable them to have a reasonable length of service before going on the retired list. It is stated that under the present system there are too many lieutenant-commanders of an age when they should be commanders ; for example, the Naval Academy class of 1920 who should be lieutenant-commanders at the age of 36 will not reach that rank until 1939, at a mean age of 41.

A Bill has been passed to provide for the retirement of 350 officers who are found not qualified for advancement beyond the rank of lieutenant-commander. About 600 officers who have seven

years' seniority as junior grade lieutenants or fourteen years as lieutenants without promotion are to be examined by a selection board, and 60 per cent. of the number will be retired on June 30, 1936. In order to provide more junior officers, all graduates of the Naval Academy will, as from 1933, be eligible for commissions. Hitherto only the upper half of the graduated classes at Annapolis have been granted them. The latest class numbers 606, and is the largest since 1930. It includes 74 from the enlisted ranks.

#### LOSS OF THE FULTON.

The gunboat Fulton caught fire in the engine-room on March 14, 1934, and was completely burnt out. H.M.S. Wishart took off 130 of the crew by going alongside the burning ship in a heavy swell. About 50 more were picked up by S.S. Tsinan. The wreck was towed to Hong-Kong by dockyard tugs.

#### FLEET MOVEMENTS.

On May 31, 1934, President Roosevelt reviewed the U.S. fleet off the entrance to New York harbour. Eighty-six vessels steamed past the President, who was on board the 10,000-ton cruiser Indianapolis. The review was described as the greatest peace-time pageant in American naval history.

The whole Fleet was due to be transferred from the Atlantic back to the Pacific in December, 1934, and was to engage in extensive manœuvres in the Puget Sound—Alaska—Hawaii triangle. This concentration of naval force on the western side of America always arouses some suspicion, if not alarm, in Japan.

### JAPAN.

#### DEATH OF ADMIRAL TOGO.

Fleet Admiral Marquis Togo died in Tokyo on May 30, 1934. He was Japan's most famous naval commander and one of the greatest Admirals of his time. He first saw service at the age of twenty-one in the civil war which resulted in the restoration of the Imperial régime. He was promoted to flag rank at the end of the war with China at the close of the nineteenth century. In 1903 he was given command of the Combined Fleets, and on May 27, 1905, he gained an epic victory over the Russian Fleet in the battle of the Sea of Japan. On peace being signed he became Chief of the Naval Staff. During the Great War he was a member of the Supreme Council of War. Admiral Togo received his early nautical training in 1873 in the Worcester, where his flag is now a cherished possession. He was an Honorary Member of the British Order of Merit.

#### POLICY.

With a Flag Officer as Prime Minister, Japanese naval interests should be well looked after; all the more so because Admiral Okada,

who took office on July 8, also acts as Minister for Overseas Affairs—not to be confused with the Minister for Foreign Affairs. Admiral Osumi remains Minister of Marine.

The annual report on the administration of the South Seas Mandate, which was duly dispatched to the Japanese Consul-General in Geneva in July, for presentation to the League, states that no military or naval forces or equipment are maintained in the islands and that no military instruction is given to the natives. Order is preserved solely by the police. The Consul-General, it is stated, was instructed to intimate that, as the islands were entrusted to Japan under the Treaty of Versailles, she would not surrender them even if called upon to do so when her withdrawal from the League becomes effective.

#### CAPITAL SHIPS.

For several years the modernisation and reconstruction of Japan's battleships and battle cruisers has been proceeding steadily. The first to be taken in hand were the three battle cruisers Haruna, Kirishima, and Kongo. The effect of the alteration in the case of these three ships has been to reduce their speed to about 26 knots, and they are now classified as battleships ; but their character has not been materially changed. The battleships Fuso, Yamashiro, Mutsu, and Nagato have also been dealt with, leaving only the Hyuga and Ise to be modernised. It is understood that the work carried out includes improvements to under-water and deck protection, increased elevation to turret guns, installation of catapults, new A.A. armament, new fire and searchlight control gear, and, in certain ships, new machinery and boilers.

#### NEW CONSTRUCTION.

The four new cruisers of the "Mogami" class are in various stages of construction. The Mogami was launched on March 18, 1934, and the Mikuma on May 31, 1934. The Suzuka was laid down on December 11, 1933, and the Kumano on April 4, 1934. The Suzuka was launched at Yokosuka on November 20, 1934. These ships are to carry fifteen 6·1-inch guns in five triple turrets. As this is the same armament as the new 10,000-ton American cruisers, some doubt has been expressed as to what will be their actual tonnage ; nominally, they are to displace 8,500 tons. It is also reported that these ships will have a draught of under 15 feet.

Of the twelve 1,378-ton destroyers of the 1931 and 1932 programmes, nine have been laid down, of which two are completed. Following on satisfactory results in building the Hatsuharu, rivetless construction is to be employed in some of the later destroyers.

Attention has been called to Japan's efforts to increase the number of her torpedo craft without infringing the London Treaty by the accident to the Tomozuru. This is one of a new class of 527-ton craft, officially classified as torpedo boats, four of which were authorised in the 1931 programme. The Tomozuru capsized

in rough weather off the Goto Islands on March 12, 1934. Of the crew of 118 only 13 were saved—all ratings who were extracted from the vessel after she had been towed into Sasebo and docked, keel up. She has since been righted, and it is reported that she will be re-commissioned. Meanwhile a commission has been appointed to investigate the stability of all future construction. Their inquiry is also to extend to the modernised battleships. The Tomozuru carried three 5-inch guns and four torpedo tubes—an enormous armament on such a small displacement. Sixteen more of her class are authorised under the 1934 programme, but it seems probable that there will now be a tendency to reduce the top hamper, which has become a marked feature of Japanese men-of-war, and the latest torpedo boats will have a reduced armament. An immediate effect of the accident was the appointment of new heads to the construction, engineering, and technical departments.

The Japanese Navy sustained a further loss as a result of a collision between the destroyers Miyuki and Inazuma on June 29, 1934. The accident took place in a dense fog, and the Miyuki's stern was cut off and sunk. Four ratings were killed, two others were missing, and many were injured. Although the damaged ship was taken in tow she subsequently sank.

The submarine depot ship Taigei was completed early in 1934.

According to a Press report, a new type of miniature submarine has completed successful trials. This is a craft which displaces only 12 tons and has a length of only 32 feet 6 inches. It is electrically driven by means of 50 storage batteries, the under-water speed being about 8·3 knots. The armament consists of one torpedo-tube and a machine gun. There is a crew of four. The submarine can remain submerged for about three hours.

## FRANCE.

The Naval Estimates for 1934 amount to 2,742,084,616 francs ; this is an increase of nearly 30,000,000 francs on those for 1933, but they now include over 50,000,000 francs for the naval air service, the cost of which was formerly met out of the Air Ministry estimates. In addition to the above, a sum of 20,000,000 francs has been allotted to a special construction programme. This provides for shipbuilding, aircraft for coast defence, naval artillery, and underground reservoirs for oil fuel. Later in the year 595,000,000 francs were voted by the Government for oil fuel. According to an article in the *Echo de Paris* by Capitaine de Vaisseau Somborn, 144,000,000 francs of this vote is to be utilised for the accumulation of oil fuel. By 1938, he said, sufficient tanks are to be available to hold 1,500,000 tons of oil fuel and 1,627,000 tons of Diesel oil. He estimated the peace-time consumption at 300,000 tons of oil fuel and 20,000 tons of Diesel oil per annum. These figures would have to be multiplied by ten for the war-time consumption.

## NEW CONSTRUCTION. •

The 1934 building programme makes provision for one battle cruiser, to be named the Strasbourg ; one flotilla leader, the Volta ; one first-class submarine, the Roland-Morillot ; and one second-class submarine, the Aurore. The Strasbourg is to be built at the Chantiers de Penhoët St. Nazaire, on the slip vacated by the liner Normandie. Her keel was laid on November 26, 1934. She will be an improved Dunkerque, and although nominally of the same displacement, 26,500 tons, there is reason to believe that she will be faster and that the secondary armament will be heavier. According to available information, both these ships will be particularly well protected. It is reported that the Dunkerque will have an armoured belt of 10·8 inches thick extending from the foremast quadruple 13-inch turret to the after quadruple 5·2-inch turret. The upper armoured deck is 4·9 inches and the lower one 2 inches thick. A special bulkhead 14½ feet from the outer hull is designed to give protection from under-water attack. The two ships will ultimately replace two of the "Jean Bart" class, which, under the Washington Agreement, are long overdue for scrapping. The Dunkerque is due for completion in 1935.

M. Pietri, Minister of Marine, has informed the Senate that a third battleship would be laid down before the London Conference took place. He hoped it would not have to be a 35,000-ton ship.

The last of the 10,000-ton cruisers, the Algérie, is now completed. Six 7,600-ton cruisers are in various stages of construction. These are improved "Emile Bertins" ; nine 6·1-inch and eight 3·5-inch A.A. guns replacing the nine 6-inch and four 3·5-inch A.A. weapons in the earlier class. It is also reported that they are to be lightly armoured. The Emile Bertin completed her steam trials in the summer and is credited with a sustained speed of 35 knots.

Six flotilla leaders of the "Triomphant" class were due to join the fleet by the end of 1934. The nominal full speed of these vessels is 37 knots with 74,000 h.p. ; but recently completed French torpedo craft have all greatly exceeded their designed speed and horse-power, and it was anticipated that these new leaders will attain over 40 knots with 100,000-h.p. engines. Armed with five 5·5-inch guns and nine 22-inch tubes, they are greatly superior to British leaders, which are restricted under certain terms of the London Treaty, to which France refused to be a party.

## GENERAL.

It is reported that the fleet of the First Maritime Region based on Cherbourg will in future be augmented at the expense of the forces in the Mediterranean. A certain number of cruisers, flotilla leaders, destroyers, and submarines are being transferred from Toulon and Bizerta. The battleships Provence and Bretagne are joining the Second Squadron, based on Brest, and the Lorraine will follow them when her modernisation is complete. This concentration in the Channel ports is obviously intended to counter the growing

menace of Germany's new navy, especially that of the "Deutschland" class.

Following on the transfer of naval aircraft from the Ministry of Air to the Ministry of Marine, authorised at the end of 1933, the naval air service is understood to be made up as follows: ship-borne aircraft—five squadrons; shore-based aircraft—eleven squadrons; naval co-operation (autonomous) aircraft—six squadrons. The last-named include three fighter squadrons based at Marignane, and three bomber squadrons at Sidi-Ahmed.

Admiral Descottes-Genon, Commander-in-Chief of the Naval Forces in the Far East, died at Shanghai on April 17. In the War he commanded the destroyer Spahi; he was wounded during the Moroccan campaign of 1926–27 in the bombardment of the Bay of Alhucemas; and he was Chef de Cabinet to M. Leygues, Minister of Marine, 1927–28.

#### ITALY.

The Budget for 1934–35 made provision for expenditure amounting to £19,750,000 at par on the Navy. This is a decrease of £2,900,000 as compared with the previous year. But in addition to this the Italian Government has decreed a supplementary appropriation of about £5,200,000 for new naval construction, to be spread over the years 1935–40. This is intended to make provision for a programme of light cruisers, destroyers, and submarines.

In March it was stated that, in view of the disarmament conversations and as a friendly gesture to other Powers, it had been decided not to introduce any new programme of naval construction in 1934. Since then, however, the trend of events has led Sig. Mussolini to ridicule the Disarmament Conference, which he regards as moribund, and on June 11 an official announcement was made which may well have a far-reaching effect in the future. This was to the effect that, in order "to give the Italian Navy that organic composition which appears indispensable in view of the lack of accord about qualitative limitation," it has been decided to lay the keels of two battleships of 35,000 tons. These vessels were laid down, one at Trieste and the other at Genoa, on October 28, 1934, the anniversary of the Fascist march on Rome, and will be named the Vittorio Veneto and Littorio. No details of their design are, as yet, available.

#### NEW CONSTRUCTION.

In celebration of the birthday of Rome, on April 22, 1934, three warships were launched. These were the light cruiser Emanuele Filiberto Duca d'Aosta, of 6,791 tons, building at the Odero-Terni-Orlando works at Leghorn, the destroyer Scirocco of 1,450 tons at Genoa, and the torpedo boat Astore of 600 tons at Naples. These three vessels are typical of Italy's present construction programme. The Filiberto is the first of four of an improved "Condottieri" class. The displacement has been increased from the 5,069 tons of the

earlier ships, apparently to provide for greater horse-power—110,000 instead of 95,000. An aircraft catapult is being placed between the two funnels. A second ship, the Eugenio di Savoia, belongs to the same programme, and two more, the Garibaldi and Duca degli Abruzzi, were laid down in 1933. The Muzio Attendolo, of slightly less displacement—5,557 tons—laid down in 1931, was launched on September 9, 1934, and her sister ship, the Montecuccoli, on August 2, 1934. The Scirocco is one of four vessels which were due for completion in 1934. They carry four 4·7-inch guns and six torpedo tubes, and are credited with a speed of 38 knots. The Astore and her sister ship, the Spica, were also due to complete before the end of 1934. It is understood that these small craft are intended for coastal patrol work and that they carry a number of depth charges. Two more, the Centauro and Climene, have been laid down.

#### GENERAL.

In view of the discussions in late years on training in the British Navy, and the weight of opinion that experience in small, modern ships is of greater value than a reversion to sailing-ship training would be, it is of interest to note that the Italian Navy goes in for both systems. Training in sail is carried out in the sailing ships Colombo and Vespucci and in the sailing brigs at Pola. The Vespucci was fitted out last summer to take a hundred cadets from Livorno for a three-months' cruise in the Levant, during which sixty days were to be spent at sea.

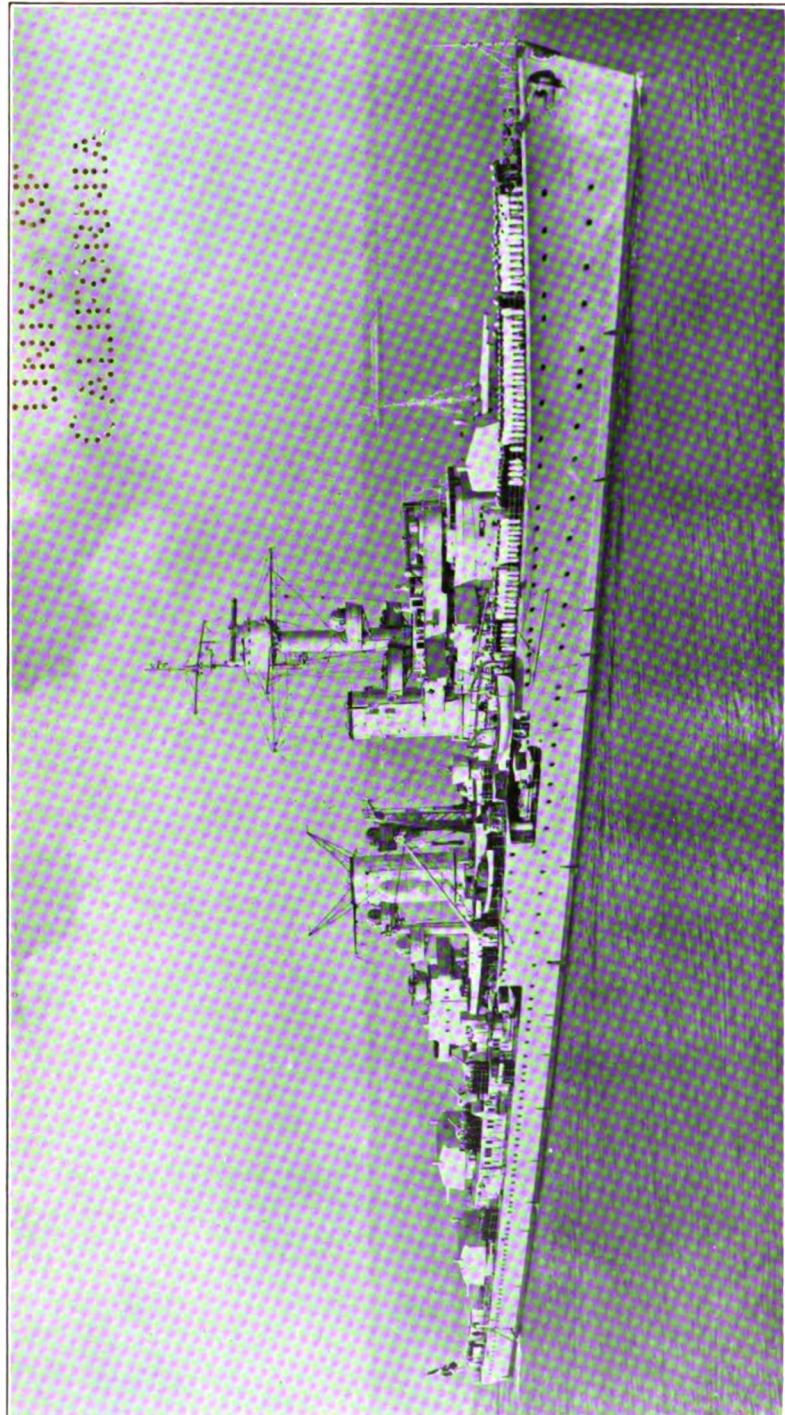
At a later stage in their career, officers go to the training flotilla based on Taranto. This consists of a leader and twelve destroyers, with a captain in command of the flotilla and a commander in charge of each division. Lieutenants of three to four years' seniority are given command of the destroyers for about two months, and every lieutenant in the Italian Navy is given this invaluable chance to show his powers of command and of initiative, which is specially encouraged. Every lieutenant also does a period in the Training Submarine Flotilla ; but the submarines have more permanent and experienced commanders.

There was much enthusiasm in the Italian Press early in 1934 on the return of the cruiser-submarines Sciesa and Toti from their five-thousand-mile tour of African ports, occupying eighty-four days. This achievement is to some extent comparable with that of the nine British submarines which made their way out to China between 1930 and 1932 without escort. The vastly increased mobility and endurance of the submarine in recent years is self-evident.

#### GERMANY.

The Budget of the Defence Ministry for 1934–35 shows an increase of nearly 33 per cent. on that of the previous year. It amounts to about £44,716,000 at par ; an increase of about £11,000,000 on 1933–34. The Navy does not, however, appear to be benefiting to





(Photo by Wright and Logan, Southwest.)

**THE GERMAN CRUISER KONIGSBERG, FLAGSHIP OF REAR-ADMIRAL KOLBE.**

*Arriving at Portsmouth, July 11, 1934.*

any abnormal extent by the extra expenditure, and so far there are no signs that Germany intends to break away from her obligations in the matter of her Fleet, but there is a certain amount of propaganda in the Press calling attention to the lack of submarines and aircraft and making comparison with the navies of other Powers.

#### NEW CONSTRUCTION.

The building programme is proceeding steadily, according to plan. The third "pocket battleship" was launched at Wilhelmshaven on June 30, 1934, and named the Admiral Graf Spee in honour of the victor of the Coronel battle. The Admiral Scheer was commissioned for service with all ceremony at Wilhelmshaven on November 12, 1934, by Captain William Marschall, who commanded U.C. 74, and U.B. 105 in the War. The fourth ship, Ersatz Elsass, was due to be laid down before the end of 1934.

The cruiser Emden, which is undergoing extensive alterations at Wilhelmshaven, is due for completion in 1935. The cruiser Nurnberg was launched at Kiel on December 8, 1934.

#### GENERAL.

In July German warships paid their first visit to an English port since the War when the cruisers Konigsberg and Leipzig, under the command of Rear-Admiral Hans Kolbe, visited Portsmouth. The rear-admiral and captains paid an official visit to the Admiralty and were received by the First Lord and First Sea Lord. Admiral Sir John Kelly, Commander-in-Chief at Portsmouth, lunched on board the Konigsberg, the German Ambassador also being present. In October, the Deutschland paid a short visit to the Firth of Forth.

Admiral Friedrich von Ingenohl, who commanded the High Seas Fleet during the first six months of the War, died on December 19, 1933, at the age of seventy-six. He was relieved from his command after the Dogger Bank action, and retired in August, 1915.

The badge of naval officers' uniform caps has been altered. It now takes the form of a silver Nazi badge, an eagle perched on a swastika.

#### SPAIN.

The political unrest and financial stringency from which Spain is suffering are reflected in the sparsity of attention and money given to the Navy. There was considerable gathering of officials for the naval manœuvres and review which took place off the Balearic Islands in the summer, but *La Libertad*, in deprecating this display, remarked that it merely showed foreigners the smallness and inefficiency of the Spanish Fleet.

The construction of the 10,000-ton cruisers Baleares and Canarias, which were laid down at Ferrol in August, 1928, has been retarded repeatedly. The Canarias was due for completion before the end of 1934; the Baleares was expected to be completed some time in

1935. Four flotilla leaders of 1,500 tons are also under construction.

The sailing training ship Juan Sebastian de Elcano, which made an extensive cruise with forty midshipmen to South American ports early in the year, left Spain again in August for a cruise to the Mediterranean and India. Her ports of call included Malta, Haifa, Colombo, and Madras. The Elcano is a four-masted schooner equipped with Diesel engines, and, in addition to the midshipmen under training, carries sixteen officers and instructors as well as the captain.

#### OTHER CONTINENTAL NAVIES.

##### DENMARK.

New ships building for the Danish Navy during 1934 were the Ingolf—a sloop of 1,180 tons armed with two 4·7-inch guns and having a designed speed of 15 knots—which is now completed ; and three torpedo boats—the Glenten, Hogen, and Ornen—of 285 tons, armed with two 3·5-inch guns and six torpedo tubes, and having a designed speed of 27·5 knots ; they are also fitted to lay mines and drop depth charges.

##### ESTONIA.

In 1933 Estonia sold the most powerful ships in her Navy, the destroyers Lennuk and Vambola, to Peru. At the time they were regarded as being unsuitable for local defence. It is reported that a sum of 9,000,000 kronen has been voted for a construction programme to include two submarines, three or four destroyers or coastal motor boats, and twelve bombing aircraft.

##### GREECE.

There was a marked increase in the Naval Budget for 1933–34, mainly to provide payment for the destroyers built in Italy. It was announced in April last that the next two destroyers are to be built in the naval arsenal ; they have since been laid down at Salamis.

These latter form part of a projected programme to be spread over a term of years. This programme is divided into four sections, each of which will include two destroyers. In addition, a light cruiser is proposed in section "B," and submarines and other vessels in sections "B" and "D." The programme would also make provision for bringing Salamis arsenal up to date and for the re-organisation of the coastal defence.

##### NETHERLANDS.

The second-class cruiser building for the East Indies Station originally known as the Celebes has been renamed the De Ruyter,

and the destroyer previously known as the De Ruyter is to be renamed the Van Gendt.

The submarines K.XV and K.XVII have been formally taken over by the Ministry of Marine.

A National Cruiser Fund has been organised by the people of Batavia with the object of collecting funds to present a new cruiser to the Queen of the Netherlands.

#### NORWAY.

A sum of 2,000,000 kronen has been nominated for 1934-35 for new construction and modernisation of warships. The question of modernising the existing coast defence vessels was suggested, but it was decided that they are too old to justify it ; it is, however, under consideration to modernise the three destroyers of the "Draug" class.

The newly built minelayer and training ship Olav Trygvason has relieved the old coast defence ship Tordenskjold for instructional duties. The Trygvason displaces 1,920 tons and has a maximum speed of about 20 knots with 6,000 h.p. Her propelling machinery consists of two Diesel motors with electric transmission and two geared turbines. For full speed the electric motors and steam turbines work together. The armament consists of four 4·7-inch Q.F. guns, one 8-inch A.A. gun, and two machine-guns. The ship has a radius of action at 14 knots of 3,000 miles.

#### POLAND.

It is proposed to develop the shipyard of Gdynia so that naval and merchant shipping can be built in Poland. New construction at the port is at present limited to one minesweeper ; but it has been decided that three of the six new submarines to be built shall be put in hand at Gdynia. In addition, a minelayer is being built in France, and three more minesweepers are in hand—one at Danzig and two at Modlin.

The construction of two destroyers is also contemplated.

#### PORTUGAL.

The submarine Delfin was launched from Vickers-Armstrong yard at Barrow on May 1, 1934. Two more vessels, the Espadarte and the Golfinho, of the same class, were launched from this yard on May 30. These craft are similar to the British "L" class. They displace about 870 tons, and have a speed of 16 knots on the surface. The armament consists of one 4-in. gun and six 21-in. torpedo tubes.

Two new destroyers are being built at Lisbon to replace those completed earlier in the year and sold to Colombia.

Both the sloops building in Messrs. Hawthorn, Leslie's yard have been launched ; a second-class sloop is building at Lisbon.

### SOVIET UNION.

The *rapprochement* of France to the Soviet Union during the past year, which has led to the introduction of the latter to membership of the Assembly of the League of Nations, is further reflected by a Soviet Naval Mission to France and negotiations for building four 7,000-ton cruisers and four destroyers in French shipyards. The Mission visited Brest and Toulon and was entertained at the Prefecture Maritime of the latter port.

Italy also appears to be taking an interest in potential orders from Russia, and it is understood that an Italian Mission visited Moscow in May last to study the Soviet Defence Forces, and that it afterwards visited the Black Sea Fleet. Two coastal patrol boats building at the Ansaldo Shipyard, Genoa, were launched on August 18, 1934.

The Soviet Naval authorities have a strong predilection for salvaging sunken warships, and orders have been given to raise the three submarines Narwal, Kachalot, and Kit sunk in the Black Sea in 1918. It is proposed to recondition these craft and that they shall reinforce the Black Sea Fleet; but it is almost inconceivable that, in view of their long immersion, they can be made efficient.

The Baltic Fleet paid a visit to the port of Gdynia in September. This was in return for the visit paid by the Polish destroyers Burza and Wicher in July, 1934.

It is reported that the local forces at Vladivostok have been reinforced by eight to twelve submarines.

### SWEDEN.

The proposed Naval Budget for 1934-35 amounted to 34.9 million kronen. Speaking on naval policy, Admiral Lybeck, Chief of the Naval Staff, said there were two problems which required to be solved—the immediate completion of replacement construction as regards defence vessels, and a removal seawards of coast fortresses, particularly at Stockholm and Karlskronen. He advocated immediate replacement construction in the case of the Oscar II, which is thirty years old, and remarked that even the three latest coast defence vessels Sverige, Drottning Victoria, and Gustav V are nearing the age limit.

The Admiralty have produced plans for a new defence vessel, the main features of which are: displacement, 7,685 tons; over-all length, 426 feet 6 inches; speed, 22.5 to 23 knots; armament, four 28-cm., twelve 12-cm., ten or twelve 25-mm. guns, and eight to ten light guns; director control; two armoured decks; oil fuel. The ship is to have an elevated forecastle to about midships, and a small central superstructure. The four 28-cm. guns will be mounted in twin turrets forward and aft, as in the Sverige. The 12-cm. guns will also be mounted in pairs and so placed that eight can fire on the broadside. It is estimated that the ship will take four years to construct, and will cost 27.8 million kronen.

The hangar-cruiser Gotland was commissioned for trials on

August 14, and is reported to have attained a speed of 28 knots. She is to carry eight seaplanes, and is armed with six 6-inch guns. The Gotaverken Shipbuilding Company are building another warship, the destroyer Goteborg. A second destroyer is also building, at Karlskrona.

The Swedish Fleet was engaged in comparatively extensive exercises on both the east and west coasts in July, 1934. These were designed to test certain of the local defences and to investigate the attack and defence of merchant shipping. Submarines and aircraft took part in the exercises.

#### TURKEY.

The President has given provisional sanction for a sum of about £7,500,000 to be allocated to new construction. It is reported that Turkey aspires to build two 10,000-ton cruisers—possibly pocket battleships of the German type, and some leaders, mine-sweepers, and auxiliary vessels. A Naval Mission has been visiting the United States and Japan, and it is further reported that a considerable proportion of the construction programme may be undertaken in the latter country. Actually there is no new construction in hand, but on being informed by Greece—in accordance with treaty agreement—that she was laying down two destroyers, Turkey notified her neighbour of a programme of ten submarines.

The battle cruiser Yavouz (*ex-Goeben*) took part in exercises carried out by the Turkish Fleet in the Sea of Marmora in August.

A naval port and dockyard are being constructed at Goleuk in the Gulf of Ismail.

The distinguishing colours on officers' uniforms to designate the various branches are now worn in the form of patches or tabs on the coat collar instead of being inserted between the gold lace stripes.

#### YUGOSLAVIA.

The latest and most important addition to the Navy, the British-built flotilla leader Dubrovnik, took the late King Alexander on his ill-fated visit to France in October, and had the melancholy duty of conveying his body home after his assassination.

Lack of funds has held up the programme of construction approved at the beginning of 1933 and given in detail in last year's "Annual."

#### SOUTH AMERICA.

##### ARGENTINE.

The two Argentine cruisers, Venticinco de Mayo and Almirante Brown, built by the Odero-Terni-Orlando firm at Leghorn and Genoa respectively, and the completion of which was referred to in the notes on Foreign Navies in the "Annual" for 1932, have now been in service for some time. We have the authority of the

Argentine Minister of Marine for saying that "the authorities of the Navy and their Staff are satisfied with the behaviour of these vessels." Since they reached the Argentine they have been in full working order without having given any trouble.

New construction is confined to a projected programme of small, fast vessels for coastal work and the suppression of smuggling. These craft, it is stated, will be improved "M" class (*ex-German minesweepers*) now used by the Argentine Navy, of slightly larger displacement but carrying the same armament of three 75-mm. guns.

The coast defence ship Garibaldi, built at Ansaldo, Italy, in 1895, has been struck off the effective list. A sister ship, the Belgrano, was converted to act as a submarine tender in 1930, and another ship of the same class, the Pueyrredon, has been extensively repaired.

The training ship Presidente Sarmiento, in the course of an extensive visit to European waters last summer, called at Portsmouth. This was her thirty-fourth annual cruise.

#### BRAZIL.

The modernisation of the battleship Minas Geraes has been completed. The ship has been fitted with new Thornycroft boilers and the bunkers have been converted to oil-fuel tanks. The cylinders of the main engines have been re-bored, and machinery generally has been overhauled. The twelve 12-inch guns have been given increased elevation and eight A.A. machine-guns have been mounted.

Tenders have been called for for an extensive building programme to be spread over twelve years. This provides for two cruisers, nine destroyers, six submarines, and certain auxiliaries; so far the construction of the nine destroyers only has been authorised. Three are to be built at the naval dockyard on the Ilha das Cobras; the remainder will, it is understood, be ordered from British firms.

The training ship Almirante Saldanha, built by Messrs. Vickers-Armstrong, was formally handed over to her commanding officer on June 11, 1934, and arrived at Rio in the following October.

Effect has been given to the retirement scheme mentioned in last year's "Annual," and the list has been cleared of a number of older officers, thereby facilitating promotion and instilling new life into the service.

A new Naval Air Service Instructional School has been completed, and this branch of the Brazilian Navy is developing considerable efficiency with its British-built aircraft.

#### CHILE.

The Chilean Fleet is the victim of drastic economy following on the political unrest of recent years. The battleship Almirante Latorre, which had an extensive overhaul and refit in Devonport Dockyard four years ago, has been laid up in reserve, and the personnel of the Navy has been greatly reduced.

The Ministry of Marine and the Staff College are both now

established at Valparaiso. This at least has the advantage that the centres of naval administration and study are clear of the atmosphere of political intrigue and controversy of Santiago. The good effects of this policy are already to be seen in the greatly improved discipline in the Fleet.

The United States Naval attaché to Chile has been withdrawn, and his duties are now performed by the attaché at Buenos Aires.

#### COLOMBIA.

Two destroyers which were built at Lisbon by Yarrow have been purchased from Portugal. They are the Tejo, which has been renamed the Antioquia, and the Douro, renamed the Calvas, both after provinces in Colombia. The ships are of 1,282 tons displacement, armed with four 4·7-inch guns and eight 21-inch torpedo tubes, and have a designed speed of 36 knots. They are manned by crews of retired British officers and ratings who have volunteered for and been given permission to accept service under the Colombian Government.

#### PERU.

The small cruiser Bolognesi, which with her sister ship represents the biggest unit in the Peruvian Navy, is being fitted with new Yarrow boilers, which have been sent out to Callao.

The most modern vessels in the fleet are two *ex-Russian* destroyers captured by British forces in the Baltic in 1918 and transferred to Estonia, from whom they were purchased in 1933. These now bear the names of Almirante Guisse and Almirante Villar.

Two shallow-draught river gunboats are being built by the U.S. Electric Boat Company.

#### URUGUAY.

Orders have been placed with an Italian yard in Genoa for the construction of three small patrol boats. These appear to be intended mainly for the suppression of smuggling.

The small Uruguayan fleet is another victim of political inconsistency and does not appear to be in a very flourishing state.

### ASIATIC COUNTRIES.

#### MANCHUKUO.

Two gunboats of 265 tons were built in Japan and completed during 1934. Two older gunboats and two 56-ton river craft constitute the rest of the Manchukuo Navy.

#### PERSIA.

The two sloops Palang and Babr, which are the principal units of the new Persian Navy, visited Karachi on January 24, 1934.

Three motor vedette boats are building in Italy. These are

much smaller craft than the six motor gunboats of the "Charokh" class already completed. They will displace 28 tons and be 68 feet long, and are due for delivery early in 1935.

#### SIAM.

Three 55-foot coastal motor boats are being built for Siam by Messrs. Thornycroft and are due for delivery during the first quarter of 1935.

The hulls of two destroyers have been ordered from the Cantieri Naval Riunite of Trieste. Their gun armament will be supplied by Messrs. Vickers-Armstrong, and the torpedo armament by Bofors of Denmark.

E. ALTHAM,  
Captain, C.B., R.N.

## CHAPTER III.

### RELATIVE NAVAL STRENGTH.

THE events of 1934 constituted a curious commentary on the London Naval Treaty of 1930, as an instrument of limitation. The largest volume of shipbuilding for many years was begun in the United States, and a fair amount of new tonnage elsewhere, yet all was "in accordance with the Treaty." Still more new construction can be undertaken by the United States within the so-called "limits" of the Treaty.\* In contrast, the British programme of 1934, which represented merely a continuation of the modest annual replacements which had been in progress since 1930, was, as the First Lord indicated in his speech on the Estimates on March 12, 1934, substantially all that the Treaty allowed. He said :—

I want to make it perfectly clear to the House that, by the end of 1936, we shall have the full cruiser tonnage that we can have by that date. Included therein will be the full amount of new tonnage which is allowed by the Treaty. . . . It is true that in destroyers we shall be short, by a little over 60,000 tons, of the under-age tonnage that we might have had under the Treaty. In regard to submarines we shall only be short of about 4,000 tons of the under-age tonnage that we might have had under the Treaty. There is no deficiency in the total permitted tonnage in either category. To sum up: By the end of 1936, in all categories we shall have the full tonnage that we are allowed by the Treaty.†

The explanation of this contrast is that the London Treaty, while essentially one of limitation for Great Britain, and to a lesser extent for Japan, left the other signatories with such wide margins for expansion as to constitute no real limitation at all. The result may be seen in a comparison of the principal navies as they stood on January 1, 1930, the month in which the Conference met, and on January 1, 1935, respectively. In regard to completed cruisers, the positions were as follows :—

\* "During the past year work was started on 24 vessels for the U.S. Navy, bringing the number under construction to 70. When this construction is completed within the next 30 months, the U.S. Navy will still be short by 78 ships of the full treaty strength."—Mr. Swanson, Secretary of the Navy, in his Annual Report, December, 1934.

† By "new tonnage" is meant the amount of new ships allowed to be completed during the period of the Treaty, which in the case of cruisers was limited to 91,000 tons. By "under-age tonnage" is meant tonnage within the age limits of sixteen years for cruisers, twelve years for flotilla leaders and destroyers, and thirteen years for submarines. In the "full tonnage" in all categories which the First Lord referred to, he included those ships which will be over the age limits for their particular classes and which will therefore be obsolete.

## CRUISER STRENGTH, 1930 AND 1935.

	Great Britain.	U.S.A.	Japan.	France.	Italy.
January 1, 1930 .	54	19	29	14	12
January 1, 1935 .	50	26	31	18	24
Increase or Decrease	-4	+7	+2	+4	+12

Whereas the British cruiser fleet has been scaled down to fifty ships in accordance with the offer made before the opening of the London Conference of 1930, every other fleet shows an increase in cruisers, and those of Italy have doubled in number.

Figures compiled by the United States Naval Institute and published in the *Proceedings* of that body, bring out this point even more strongly, as will be seen from the following :—

## CRUISER TONNAGE, 1930 AND 1934.

	Great Britain.	U.S.A.	Japan.	France.	Italy.
June 1, 1930. Ships . Tonnage :	54 327,111	13 100,500	29 166,815	11 81,800	11 60,971
August 1, 1934. Ships Tonnage :	51 342,856	24 202,950	34 216,895	18 157,737	24 156,319

A comparison of these figures of tonnage indicates that whereas those of Great Britain were increased by 1 per cent. (due to the completion of heavier ships, the *number* of vessels being less), those of Japan were increased by 18 per cent., those of France by over 19 per cent., those of the United States were more than doubled, and those of Italy were  $2\frac{1}{2}$  times what they were at the signing of the Treaty. When the strength of British cruisers was reduced to fifty as a gesture to the world, the limitation was accompanied by definite conditions, one of which was "that the Powers reduce correspondingly their projected programmes." \* The facts show that they have not done so; but on the contrary are now possessed of forces much stronger, both absolutely and relatively, than was the case in 1930.

## CAPITAL SHIPS.

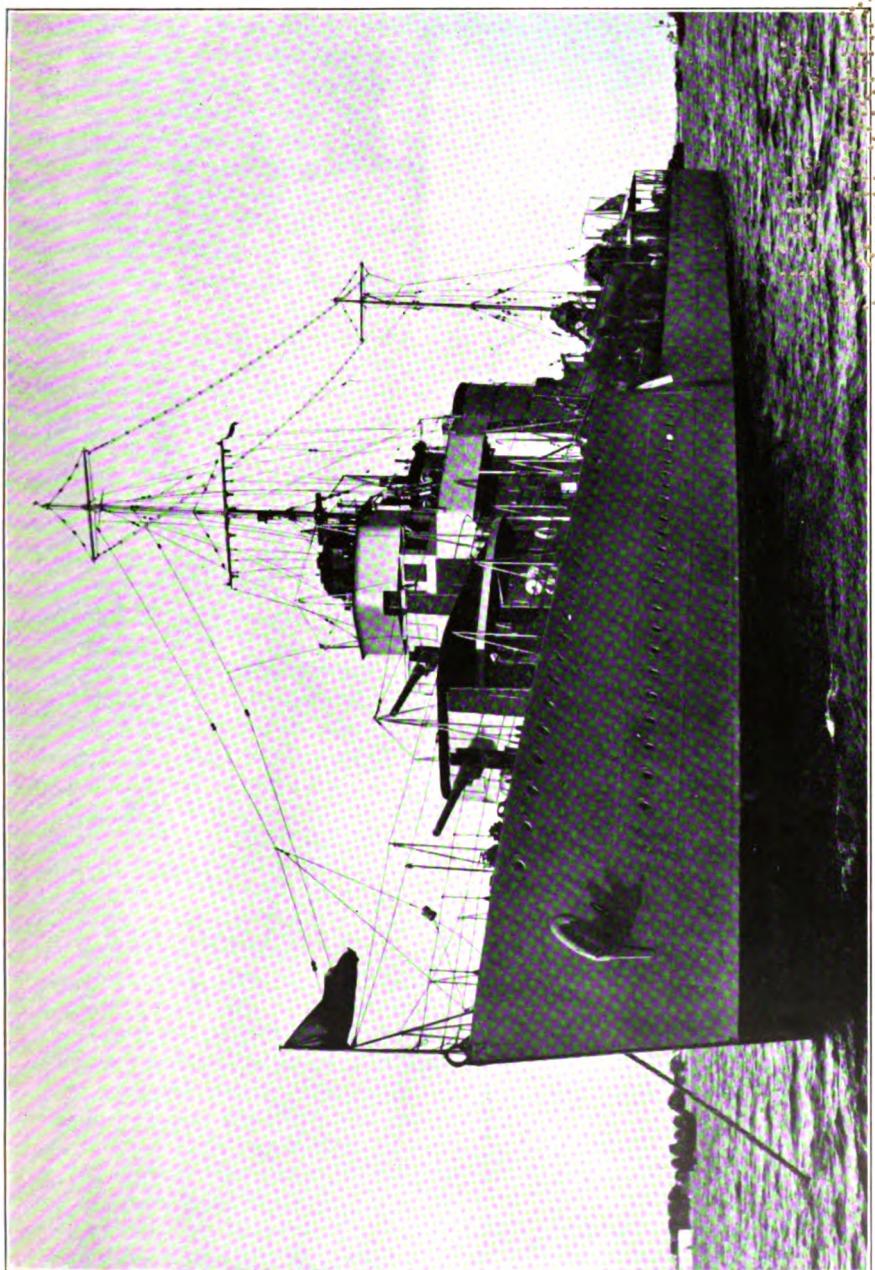
Seven battleships were building or authorised in Continental navies at the end of 1934, an increase of three compared with a year earlier. The additions were one ship for France, the *Strasbourg*, laid down on November 26, 1934, and of similar type to the *Dunkerque*; and two for Italy, the *Vittorio Veneto* and *Littorio*. The Italian ships are being built up to the maximum of 35,000 tons each

\* First Lord's Statement, July 2, 1930. Cmd. 3620.

(Photo by Charles E. Brown.)

THE COLOMBIAN DESTROYER ANTOQUIA.

Purchased from Portugal, 1931.



1  
2  
3  
4  
5  
6

allowed by the Washington Treaty of 1922, and are the only ships of such tonnage to be begun by any Power since the Nelson and Rodney were allowed to be built by Great Britain in 1922, to balance her fleet after the retention of post-Jutland vessels by the United States and Japan. France and Italy, in beginning the construction of two battleships each, are exercising rights granted them under the Washington Treaty, and continued in the London Treaty, to lay down one ship each for replacement purposes in the years 1927 and 1929. Hitherto these rights have been in abeyance. Great Britain, the United States, and Japan, on the other hand, have agreed under the London Treaty not to lay down until after 1936 any of the replacement tonnage allowed for them in this category of vessel.

As the Nelson and Rodney took 4½ years to build, it may be 1941 before any of these Powers have a new battleship in service, unless the rate of construction is speeded up. Allowing four years for construction, the two French battleships should be completed, the Dunkerque in 1936, and the Strasbourg late in 1938. The two Italian ships should also be ready for service towards the end of 1938. By that time, Germany should have completed her squadron of four small battleships of the "Deutschland" class, of which the name-ship was completed in 1933, the Admiral Scheer is due for completion in 1935, the Graf Spee (launched in 1934) is due to follow her in 1936, and the Ersatz-Elsass in 1938.

France may, if she wishes, build a third battleship by way of a replacement for the France, which was sunk after grounding in Quiberon Bay on August 25, 1922, and which was one of the capital ships allowed to be retained by her under the Washington Treaty. Except for this, both France and Italy, as signatories to Part I. of the London Treaty, have agreed to defer until after 1936 the construction of the new tonnage which had been allowed them for the years 1931 to 1933 inclusive. The position in January, 1937, therefore, when Great Britain is permitted under the London Treaty to resume battleship construction, may be that Germany will have four ships (10,000 tons); France, two or three ships (26,500 tons or larger); and Italy, two ships (35,000 tons), built or building. By 1937, too, each of these Powers will be eligible if they wish to begin more ships. Failing an international agreement to limit the size and power of individual vessels, the replacement of the British battle fleet which must begin in 1937 will be very costly. Yet, as Lord Beatty has said, "It is on the battle fleet that our whole Imperial security must finally devolve," and from the financial standpoint it is important to remember, as has been emphasised in the United States, that something like 85 per cent. of shipbuilding expenditure goes in wages.

An analysis of the possibilities of French construction in capital ships was made by M. Jacques Stern, the *rappoiteur*, in the preamble to the French Navy Estimates issued on November 26, 1934. By the terms of the Washington and London Treaties France has the right to complete, before December, 1936, 105,000 tons of capital ships. The Dunkerque and Strasbourg account for 58,000

tons, leaving 52,000 tons in hand. M. Stern shows that this enables France to build two more "Dunkerques" of 26,000 tons each before 1937, or if necessary to decide on the building of two battleships of 35,000 tons: He added :—"The first could be laid down at once. The second could be ordered now and the manufacture of its components could begin; the ship would be effectively laid down after January 1, 1937." M. Stern expresses the view held by some French experts that "the institution of the 35,000-ton ship as the standard type in the Mediterranean is wanton and unnecessary," but says that Italy "has always followed American naval policy closely, and the United States has always insisted on the big ship." \*

#### A COMMERCE PROTECTION STANDARD.

A comparison of relative strength in regard to battle fleets is fairly simple. In pre-War days the country felt reasonably secure if its capital ships (with their proper quotas of light craft) were approximately equal to those of any other two Powers, and during the War the 60 per cent. superiority over Germany made possible the control of the North Sea, the main theatre, and was the foundation on which all other operations of the Allies depended. But there is much more in naval strength than is represented by the battle fleet, and the question of what should be the standard of strength in other types is not easy to determine. What number of cruisers, for example, ought Great Britain to possess to ensure protection to the 80,000 miles of sea routes operated by her merchant ships?

Until just before the opening of the London Conference of 1930, it was part of the policy of the Admiralty and the Government that cruisers for commerce protection could not be assessed merely by what other Powers might have, but rather by the work required of them on the trade routes. Two ex-First Lords may be cited on this point. Mr. L. S. Amery, who was a member of the Board at the time of the signing of the Washington Treaty, has said :—

Throughout the negotiations which led to that treaty, Lord Balfour, Lord Lee, and Lord Beatty were absolutely firm on one point, namely, that there should be no numerical limitation of our cruiser strength because our cruiser strength is something which cannot be fixed with reference to the cruiser strength of others, but only with reference to our own needs in regard to patrolling the highways of the ocean. (Hansard, House of Commons, March 12, 1934.)

Similarly, Lord Bridgeman, when First Lord, speaking at the R.N.V.R. (Auxiliary Patrol) Club in March, 1926, said :—

The programme the Government laid down was the minimum programme for the safety of this country on the one-Power standard to which we were committed. There was always a little danger in talking about the one-Power standard. That only existed in regard to battleships and ships of large size. It would be a very dangerous thing for this country to allow it to be thought that we could be satisfied with a one-Power standard in cruisers, for example. In cruisers we wanted to feel that we were, at any rate, superior to other countries and were able to afford protection for our trade. (*The Times*, March 19, 1926.)

Any comparison of the extent of the British oversea trade routes with those of other Powers will show that the numbers of

\* *The Times*, November 27, 1934.

cruisers possessed by those Powers is out of all proportion to the work required of them for the protection of commerce.

#### PRESENT CRUISER TOTALS.

The cruiser totals of the Powers at the end of 1934 showed that the number of British cruisers had been reduced during that year from 53 to 50 ; that no change had taken place in those of Japan (31) and Italy (24) ; that France had added one ship, making a total of 18 ; and that the United States had increased from 22 to 26. The output since the War is shown in the accompanying tabular statement, which illustrates the regularity of Japanese construction up to the time of the Treaty, the falling off in British construction after 1929, and the activity since that date in the United States and Italy :—

CRUISERS COMPLETED FOR THE PRINCIPAL POWERS.

	Great Britain.	U.S.A.	Japan.	France.	Italy.
1920	—	—	1	—	—
1921	1	—	4	—	—
1922	4	—	3	—	—
1923	—	6	3	—	—
1924	1	3	1	—	—
1925	1	1	3	—	—
1926	2	—	2	1	—
1927	—	—	2	2	—
1928	7	—	1	2	—
1929	4	1	3	—	2
1930	3	4	—	2	—
1931	1	3	—	2	4
1932	—	2	4	2	6
1933	2	1	—	—	1
1934	2	4	—	1	—
	28	25	27	12	13

#### BRITISH CRUISER STRENGTH.

In the early part of the year, the total of British cruisers stood at 53, including ships paid off for disposal, but still retained in the Navy List. Two vessels were passed into service during the year, the Orion and Neptune, and the following were scrapped :—Comus and Champion (completed 1915), Cambrian, Canterbury, and Concord (completed 1916). The present total of fifty is made up as follows :—

" C " class, completed 1916–1922, 3,895–4,290 tons, four or five 6-inch guns	15
Brisbane and Adelaide (Australian Navy), 1916–1922, 5,120 tons, eight or nine 6-inch guns	2
" D " class, completed 1918–1922, 4,850 tons, six 6-inch guns	8
" E " class, completed 1926, 7,550–7,580 tons, seven 6-inch guns	2
" Hawkins " class, completed 1918–1925, 9,700–9,996 tons, six or seven 7·5-inch guns	4
" County " class, completed 1928–1930, 10,000 tons, eight 8-inch guns	13
" York " class, completed 1930–1931, 8,400 tons, six 8-inch guns	2
" Leander " class, completed 1933, 7,000 tons, eight 6-inch guns	4
Total	50

On January 1, 1935, out of this total of fifty cruisers, 16 had passed beyond the official age limit of sixteen years, and 34 were within that limit. During 1935, the proportion of over-age ships will remain at 16, for while six new cruisers are due for completion, at the other end of the scale six now on the list and which were completed during 1919 will reach their age limit.

#### FIFTY CRUISERS UNATTAINABLE.

Some time before December 31, 1936, the cruiser strength of the Royal Navy must be reduced again from 50 ships to 49, if the London Naval Treaty is to be adhered to. It may be as well to explain how this comes about. It is entirely due to sanguine expectations on the part of the Government of 1929-30 not having been realised. Under the London Treaty, cruisers are divided into two categories :—(a) Those with guns of more than 6.1 in. (155 mm.) calibre ; (b) Those with guns of less than 6.1 in. (155 mm.) calibre. In category (a) the British Commonwealth of Nations is allowed 146,800 tons. This tonnage had already been invested in 15 cruisers carrying 8-in. guns, before the Conference of 1930, and no more are allowed to be begun during the lifetime of the Treaty. Actually, their aggregate tonnage is a little short of that allowed by 2,830 tons, but this amount is not transferable to category (b).

The tonnage allowed in category (b) is 192,200. The amount of new construction allowed to be completed in this category during the term of the Treaty was restricted to 91,000 tons.\* Originally, it was intended to build 14 ships within this tonnage quota—9 "Leanders" of about 7,000 tons, and 5 "Arethusaes" of about 5,200 tons. In November, 1933, owing to developments in design abroad, it became necessary to build two larger cruisers, the "Southampton" (ex—"Minotaur") class, of about 9,000 tons, and the programme of 1933 was therefore altered from one "Leander" and three "Arethusaes" (four ships) to two "Southamptons" and one "Arethusa" (three ships). Consequently, on December 31, 1936, there will be only 13 cruisers of London Treaty designs instead of the 14 contemplated. Their aggregate tonnage will be 90,500.

Towards the balance of tonnage allowed in category (b) there will be only 7 cruisers within the age limit on December 31, 1936. They are :—two "Emerald" class (completed 1926) ; three "D" class, the Durban (completed 1921), Despatch and Diomede (completed 1922) ; one "C" class, the Capetown (completed 1922) ; and the Adelaide (Australian Navy) (completed 1922). The tonnage of these seven ships amounts to 38,980. Adding the 90,500 tons of new building to the 38,980 tons still remaining within the age limit, we get 20 cruisers of 129,480 aggregate tons towards the quota of 192,200 tons allowed, a deficiency of 62,720. This will be made up by the retention of 14 cruisers over the age limit. They are five of the "D" class, aggregating 24,250 tons ; four of the "Carlisle"

\* Article 20, clause (a).

class, 16,800 tons; and five of the "Ceres" class, 21,450 tons, a total of 62,500 tons.

The following table summarises the position:—

**BRITISH CRUISER STRENGTH, DECEMBER 31, 1936.**

Category (a), 8-in. Gun Cruisers.	Tonnage Allowed	146,800.
Tonnage Effective :—2 Norfolks	19,750 tons	
2 Yorks	16,640 "	
4 Londons	38,960 "	
5 Kents	48,900 "	
2 Australias	19,720 "	
Total . 15 ships	143,970 tons.	143,970
	Shortage . . . .	2,830
Category (b), 6-in. Gun Cruisers.	Tonnage Allowed	192,200
Tonnage Effective :—2 Southamptons	18,000 tons	
3 Arethusaas	16,200 "	
8 Leanders	56,300 "	
Total (new tonnage) 13 ships	. . . . 90,500 tons.	
	2 Emerald,	
	3 Durban,	
	1 Capetown, and	
	1 Adelaide	
	types	
Total (old tonnage under-age)	7 ships . . . . 38,980 ,	
	5 Danæ,	
	4 Carlisle, and	
	5 Ceres	
	types	
Total (old tonnage over-age)	14 ships . . . . 62,500 ,	
Total . 34 ships	. . . . 191,980 tons.	191,980
	Shortage . . . .	220
Categories (a) and (b), 8-in. and 6-in. Cruisers.	Tonnage Allowed	339,000
Tonnage Effective :—49 ships . . . . Total tonnage . . . . 335,950		
	Shortage . . . .	3,050

If cruiser construction continues at the rate of four ships a year for the Royal Navy, it will not be until 1941 that the output of new ships will have overtaken the wastage sufficiently to provide fifty cruisers within the age limit of sixteen years. Six ships a year would be necessary to restore the total of fifty by 1940; and eight ships a year to restore it by 1939. British cruiser strength is now (January, 1935) at its lowest ebb. This is not only because the number of ships has been allowed to decline, but because the proportion of tonnage over the age limit is heavier than it has ever been before. No other Fleet has been affected to the same extent, because in no other country was there a large amount of shipbuilding

during the War period, with its inevitable sequel that a large block of tonnage became obsolete at about the same time.

It should also be remembered that the cruisers maintained by Dominion Governments (four in Australia, and two in New Zealand) are all included in the British Empire quota of 50 cruisers, and should be deducted therefrom when considering the number available for general service. Of the remaining 44 cruisers, 15 are over the age limit, leaving only 29 ships, within the age limit, under the direct control of the Admiralty.

The following table shows the names of cruisers which have become due for replacement, but are still retained in service; the names of those due to reach their age limit during the next three years; the names of the new ships due to be completed for service within the same period; and the numbers of vessels remaining within the age limit in each year:—

**CRUISER STRENGTH, JANUARY, 1935 (AGE LIMIT 16 YEARS).**

Ships under age . . . . .	34
Ships over age (Castor, Constance, Brisbane, Caradoc, Caledon, Curlew, Calypso, Ceres, Cardiff, Carlisle, Coventry, Curacao, Vindictive, Danae, Dauntless, Dragon) . . . . .	16
Present total . . . . .	50 ships.

Year.	Due for Scrapping (Age Limit 16 Years).	Due for Completion.	Total left under 16 Years.
1935	Delhi      Dunedin Cairo      Calcutta Colombo    Hawkins	Amphion, Ajax, and Arethusa authorised 1931 Apollo, Sydney, and Galatea authorised 1932	34
1936	Effingham * Frobisher *	Penelope, Newcastle, Southampton authorised 1933 **	35
1937	Durban	Birmingham, Glasgow, Sheffield and Aurora authorised 1934	38

\* Under the special provisions of the London Naval Treaty.

\*\* Newcastle and Southampton may be delayed in completion until 1937.

**TORPEDO CRAFT.**

The totals of flotilla leaders and destroyers of the principal Powers show little variation on last year. Great Britain has 161 as against 158; the United States, 227 as against 222; Japan is unchanged at 98; France has increased from 72 to 82; and Italy, Soviet Russia, and Germany are unchanged at 91, 55, and 16 respectively. These figures give no real indication of the relative power of the flotillas to which they refer, as they take no account of the important factors of (1) age, and (2) size of individual ships. Of the 161 British vessels, 117 are over the age limit of twelve years from date of completion. The United States Fleet is worse off in

this respect, as of its 227 vessels all are over age except two of the "Farragut" class, laid down in 1932. The Farragut, completed on June 18, 1934, was the first new destroyer to be commissioned in America since 1922, when the last vessels of the War programmes were completed. Of the Japanese flotilla of 98, nearly one-half, 41 vessels, are over age, and the proportion is very similar in France and Italy.

Great Britain in 1936 will be short, by a little over 60,000 tons, of the under-age tonnage that she might have had under the London Treaty.\* When it is remembered that this represents over 40 leaders and destroyers, it will be realised that the Navy would be hard put to it in the event of an emergency to answer all the numerous calls which would be made upon this class of vessel, than which none was more hard worked during the War. The United States is setting herself resolutely to rebuild her torpedo flotilla; 30 leaders and destroyers were laid down during 1933-34, and 14 more ordered.

The types of leaders and destroyers under construction abroad show an increase of power not only on those they will replace but also on contemporary types in the Royal Navy. Details are as follows:—

	Leaders.		Destroyers.	
	Tons.	Guns.	Tons.	Guns.
Great Britain . . . . .	1,475	Five 4·7-inch.	1,375	Four 4·7-inch.
United States . . . . .	1,850	Five 5-inch.	1,500	Five 5-inch.
Japan . . . . .	1,700	Six 5-inch.	1,378	Five 5-inch.
France . . . . .	2,930	Five 5·5-inch.	1,378	Four 5·1-inch.
Italy . . . . .	1,628	Six 4·7-inch.	1,449	Four 4·7-inch.

The London Treaty limitations in this class are 1,850 tons for leaders and 1,500 tons for destroyers, with a maximum calibre of armament in each case of 5·1-in. France and Italy do not come under these limitations, as these Powers did not subscribe to Part III. of the Treaty, in which they appear.

#### SUBMARINES.

British submarines effective total 56 vessels, a reduction of 2 on January, 1934, whereas those of the United States have risen from 82 to 84; those of Japan from 62 to 66; those of Italy are unchanged at 46; and those of France have increased from 84 to 100. The French increase is an outstanding feature of submarine construction. France since the Armistice has built or is building about 80 submarines. Her effective strength has doubled within the last ten years. Unlike other types, the submarine is no answer to the submarine. A reaction to increased submarine tonnage

\* First Lord, House of Commons, March, 12, 1934.

might be expected to be found in the destroyer tonnage of other Powers, but there is no evidence of this. France has always held to the view that the submarine is defensive in character, and that she is so situated geographically that for her it is a type of particular value. At the same time, each year the submarine continues to demonstrate its seakeeping qualities.

The high water mark of size and power in submarine construction is represented by the French *Surcouf*, completed in 1932, and which, by special provision in Article 7, clause 2, of the London Naval Treaty, is allowed two 8-in. guns, and has a displacement of 2,880 tons. The limits for ordinary submarines under the Treaty are 2,000 tons, with guns not exceeding 5.1-in. calibre. As an indication of the type of submarine which might be constructed if the London Treaty were to be allowed to lapse, it is interesting to note that the *Surcouf* has 14 torpedo tubes and carries, it is understood, a stock of 86 torpedoes for them. She has a radius of action of more than 10,000 miles at ten knots, and storage capacity sufficient to allow her to remain at sea for nine weeks. The nearest approach to her in British submarines is X.1, completed in 1925, with a displacement of 2,425 tons and armed with four 5.2-in. guns. X.1, however, was reduced to one-third crew in 1931, and paid off in 1934. Illustrations of the distance passages which are possible with later types of submarines are afforded by the non-stop voyage of H.M.S. *Thames* from Portsmouth to Venice, and those of the French submarine *Heros* from Brest to Beyrouth, and a Dutch submarine to the West Indies, Tristan da Cunha, and Java.

#### COASTAL MOTOR BOATS.

Experiments with coastal motor boats in France have attracted a certain amount of attention, but except in Italy there is no indication of a revival of this type, in spite of a certain amount of success achieved by it during the War period. An objection raised to the design of the French *redettes torpilleurs à moteurs* is that they are essentially fair weather craft which could not be depended upon in rough weather. In the summer of 1934, however, V.T.B. 10, which had done 55 knots on her builders' trials, made the journey from St. Nazaire to Brest, over 200 miles, in 3½ hours, in a choppy sea, with a mean speed of over 40 knots as compared with her maximum designed speed of 47 knots. Such a performance encourages that school of thought which believes in these small, fast, cheap motor boats for coastal defence purposes, working in conjunction with aircraft. Except for a few obsolete coastal motor boats out of commission, Great Britain has no craft of this type. The French V.T.B.'s. are each armed with two torpedoes and engined with two motors of 1,000 h.p.

Coastal motor boats are, of course, beyond the limitations of the London Treaty, which exempts naval surface combatant vessels of 600 tons standard displacement and under. The principal vessels on the exempted list which have been built for any Power since the Treaty are the Japanese torpedo boats of the "Chidori"



THE PORTUGUESE SUBMARINE DELFIN.

*Launched at Barrow, May 1, 1884.  
(By courtesy of the builders, Vickers-Armstrongs, Ltd.)*

1  
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class, one of which, the Tomozuru, capsized with the loss of 100 lives. On a displacement of 527 tons, and with engines of 7,000 horse-power giving a speed of 26 knots, these vessels have the heavy armament of three 5-in. guns, whereas the most powerful of British destroyers, of 1,375 tons, carry only four 4.7-in. guns. No other Power has shown any inclination to copy the Japanese in respect of these light but heavily armed torpedo boats.

The strongest force of vessels exempt from Treaty limitations is represented by the Coast Guard Service of the United States, which is administered by the Treasury but would pass automatically under the control of the Navy Department in case of war. It is therefore an auxiliary naval force of great potency, unmatched in any other country. The total authorised complement is 11,137, and ranks and uniform correspond to those of the Navy. In commission in 1934 there were 37 cruising cutters (764 to 2,065 tons), 28 harbour tugs, 140 patrol boats, 81 picket boats, and over 2,000 other life, station, and small boats. Twelve cruising cutters ordered from the Navy yards for replacement purposes are of 2,000 tons displacement, 20 knots speed, armed with two 6-in. guns, and with a radius of 8,000 miles. They are therefore nearly twice as heavy as the British sloops, which have a speed of 16½ knots and two 4-in. or 4·7-in. guns.

#### AIRCRAFT.

The strength of the Fleet Air Arm of the Royal Navy was increased in 1934 by two flights, the equivalent of 1 squadron, and now stands at a total of 16 squadrons. The strength of squadrons varies from 6 to 9 or 12, but the total approximate strength is 165 aircraft. These are the only aircraft under the direct control of the Admiralty, but there are also the various R.A.F. units whose duties include naval co-operation or the training of personnel for the Fleet Air Arm, among which are the flying-boat squadrons. The Navy List gives the total aircraft in these units as 136, making a combined total of about 300 aircraft altogether. A proportion of the 41 squadrons to be added to the Royal Air Force under the five year programme announced by Mr. Baldwin on July 19, 1934, will be ear-marked for the Fleet Air Arm.\*

In the United States, Congress has included in the bill authorising the construction of a navy of Treaty strength a clause empowering the President to authorise the provision of aircraft necessary to equip all new aircraft-carrying vessels. The Navy Department has stated that for this purpose, and for aircraft requirements at Pearl Harbour, Hawaii, the Panama Canal Zone, and the Marine Corps Air Service, a total of 1,184 additional aircraft will be necessary, at an estimated cost of 95 million dollars. On this basis, the aircraft establishment of the U.S. Naval Air Service will be increased in five years from 1,000 to 2,184 machines. The comparable strength of naval aircraft in Japan is believed to be under 400 at present, and is to be very largely increased by 1938.

\* Three such squadrons will be formed for the Fleet Air Arm in 1935 and 1936.—Mr. Baldwin, House of Commons, November 28, 1934.

Only two vessels in the Royal Navy, apart from carriers, carry more than one aircraft, the cruisers Achilles (two Osprey), and Exeter (two Fairey III.F). In the United States, however, the majority of the battleships and cruisers carry more than one aircraft, the battleships three each and the cruisers up to six each. Further details on this subject will be found in the chapter on Foreign Fleet Air Arms.

The position in regard to aircraft-carriers is one of contrast. The three principal Powers are each continuing to provide such vessels, but none of the other leading Powers is doing so. The United States completed in 1934 the Ranger and laid down two 20,000-ton carriers, the Yorktown and Enterprise. Great Britain included a carrier in her 1934 programme, as did Japan. But no new aircraft-carriers have been laid down in France and Italy since 1927. The tonnage of British carriers was limited by the Washington Treaty to 135,000 tons. We have now 115,350 tons, and when the new ship is finished we shall scrap one of the old ones.\*

#### IN THE MEDITERRANEAN.

Although France remains disinclined to grant the Italian claim to parity, Italy is taking such steps as may secure equality for her in the near future, if indeed she has not already attained it. She has followed up her superiority in modern cruisers by the laying down of two battleships of maximum size which will quite outclass the two French ships of the Dunkerque type. The view has been expressed in Paris that France should henceforth develop her Navy on a two-Power standard to be fixed by the combined strength of the Italian Fleet on the one hand and the German Fleet on the other. This would involve her in a costly building programme, for she would need almost to double her present force of modern vessels. Reckoning only post-War ships, the position is :—

	Italy.	Germany.	Combined Powers.	France.
Battleships, built and building . . .	2	4	6	2
Cruisers, built and building . . .	19	5	24	17

The arm in which France is supreme is the submarine, for she has twice as many under-water craft as Italy.

G. H. HURFORD.

\* First Lord, House of Commons, March 12, 1934.

## CHAPTER IV.

### DISARMAMENT AND NAVAL POLITY.

*Hoopoe Bird* : First we must choose a name for the New Commonwealth—a grand resounding name.

*Peisthetairus* : What about Cuckoos in the Clouds—Cuckoo Cloudland—Nephelocugnia ?

*Hoopoe Bird* : Splendid ! That will do—a truly noble name !

*Aristophanes* : "The Birds."

On the departure of the German delegates from the Conference in October, 1933, some months were spent in diplomatic missions and conversations, which culminated in the British Memorandum on Disarmament.\* Its object was to propound a "basis of compromise" on which "general agreement could and should now be reached." Emphasis was placed on the necessity of abolishing the prohibitions placed on Germany by the Treaty of Versailles, "for an international agreement based on the admitted principle of equality of rights as a régime of security" must lead to the solution that arms permitted to one State cannot continue to be denied to another.

This doctrine, however, could not be very acceptable to France, for it meant the collapse of the Treaty of Versailles. Further missions which went out to support the Memorandum were ineffectual. The French in a note of March 17 † renewed their old demand for guarantees of action by all signatories to any convention, nor would they concur in any plan that would grant Germany legal authorisation for re-armament. Great Britain in reply asked for a precise definition of the nature of such guarantees.

On April 19 came the French note of April 17.‡ The French Government made no attempt to define the nature of guarantees. To them the German budget, showing without possibility of doubt an increase of 352 million marks, was the real reply, and the increase in the German estimates—military, naval, and air—had destroyed the basis of recent negotiations. This "dusty answer" may be said to have closed the door on further negotiations, a view taken by Signor Mussolini, who, when signing the Danubian Pact at Rome,§ stated that the Conference had failed in its general and principal objectives.

The detailed chronology of the negotiations makes on the whole wearisome reading. The labourers truly are plenteous, but the

\* Cmd. 4498, January 29, 1934.

† Further Memoranda, Cmd. 4559, 1934.

‡ In Further Memoranda, Cmd. 4559. *The Times*, April 19.

§ March 18, 1934.

harvest is small. And yet these deserts of discussion are not entirely barren. In them the fallacies of the extreme pacifist outlook have been forced to the surface and laid bare. It has become transparently clear in these long drawn out deliberations that war does not arise from armaments but from the spirit of antagonism and strife deeply latent in racial animosities and old traditions, or again from a conflict of national interests, or yet again from obligations embodied in treaties, or even from an explosion of pacific wrath hot for sanctions to be imposed on some distant country which has refused to bow to the pacifists' ideal. Armaments are no more than the instruments of policy, and unless disputants can agree on some common policy making for peace, there can be but little agreement as to the instruments which are merely the executant hands and arms of policy. The success of the Washington Conference lay in the acceptance of a pacific policy in the Pacific.

Armaments in themselves are merely the symptoms of a disorder in the body politic; the virus lies much deeper—and in the aggressive pacifist, shouting fervently for war with Japan, is recognisable in a more virulent form than in the soldier or sailor ready to fight in defence of his country.

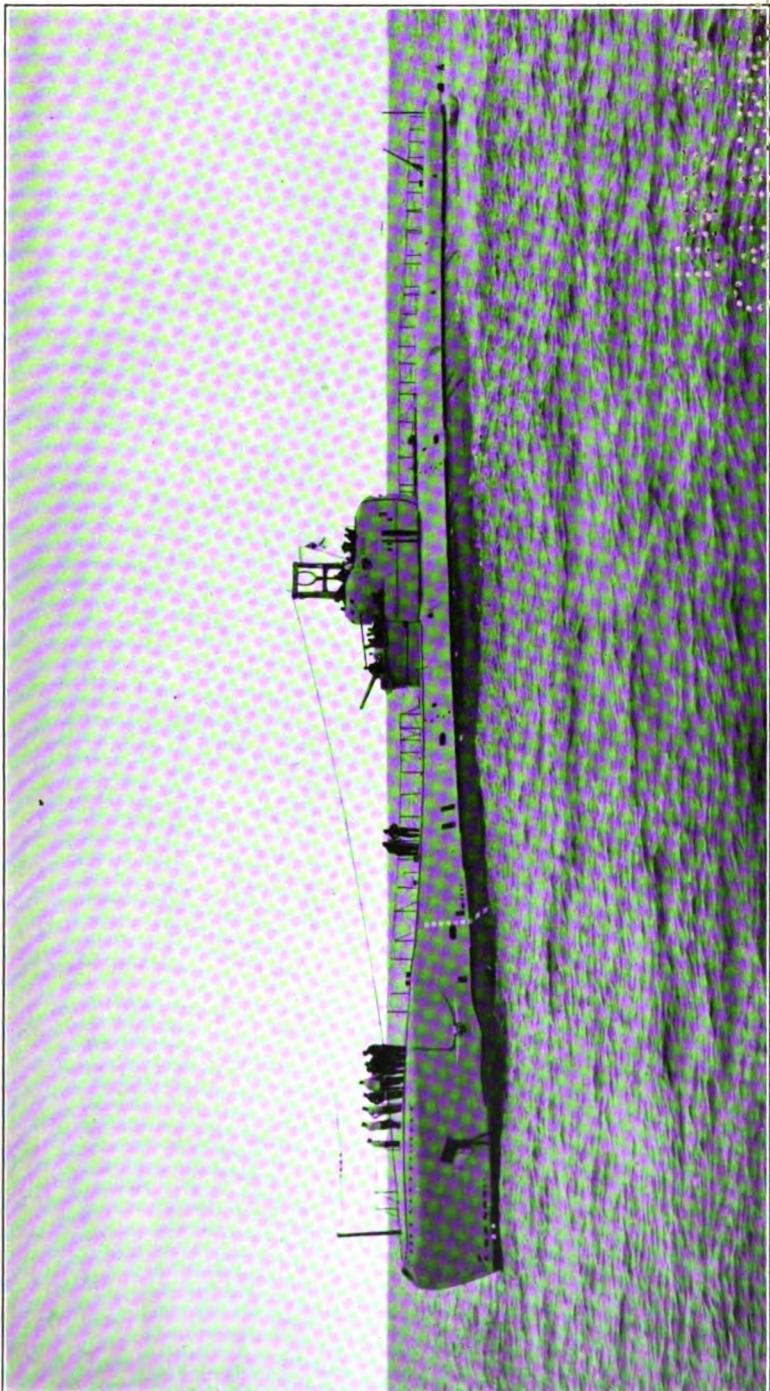
One lays down the volumes of Gooch and Temperley \* with an impression that the *causa causans* of war is not armaments but interference with other peoples' business. Everybody seems to want to interfere with everybody else. If it isn't Delagoa Bay, then it is extra-territorial rights in Zanzibar, or "access to the Niger between Liaba and Bajiba." And if it isn't these, then it is the treatment of Armenians by the Turks, where our interference did no good to the Armenians, and was used as a powerful lever by Germany to injure our relations with Turkey.

Even in these less spacious days quite a number of Englishmen seem to regard it as their peculiar province to pronounce judgment on Mussolini, or on the Nazis, or on the treatment of Magyars by Czechs, or on the polity of Japan, in bursts of explosive virtue which have to be paid for by the diplomatist or taxpayer.

The militant churchmen who are so ready to denounce armaments should read Gooch and Temperley and learn that their itch for interference is a cause of strife more potent than the armaments which they denounce.

There is another lesson to be learnt from Geneva. It has become the fashion to decry the idea of nationality and to regard all racial barriers as unreal. A decade of conferences has shown that one might as well regard the Himalayas or the Alps as unreal. Nationality is a real thing not to be exorcised by a wave of the pacifist wand. The Frenchman is not going to regard the German as French, and the Magyar is not going to embrace the Czech; the Turk, possibly with reason, dislikes the Armenian and the Greek. The nation or race is the menstruum in which human energy has expanded and developed. "The idea of nationality," says Mozley, "is one of the strongest fibres in man; it is an instinctive inspiration stirring up the race to protect its own essential qualities. It

\* "British Documents on the Origins of the War, 1898-1914."



H.M. SUBMARINE SEVERN.

Completed at Barrow, November, 1934.

(By courtesy of the builders, Vickers-Armstrongs, Ltd.)

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is a valid and worthy inspiration, for nationality is to a nation what individuality is to man."\*

Out of Geneva, then, comes the confirmation that the idea of nationality remains as potent as ever, and the corollary is equally illuminative, viz. that the consideration due to minorities is equally due to majorities. If respect is due to the idea of nationality in Hungary or Ireland it is equally due to the idea of nationality in Great Britain. This argument undoubtedly involves the problem of a possible clash of national interests and wills, and this is the riddle humanity has to solve. The old solution was by diplomacy and in the last resort by an appeal to force. In the deliberations of the last decade various other solutions have been proposed. It is permissible to regard them as of dubious value.

Take, for instance, "collective security"—a consolatory phrase which has become current coin in Geneva, France, and Great Britain—not elsewhere. The nations are to guarantee collective action against any member who breaks the peace. Great play is made here with the analogy of the policeman and of the law which imposes on all citizens the duty of suppressing disturbances and maintaining the peace by any necessary exercise of force.† But even if the theory of English common law (a distinctively national product) were applicable to the comity of nations, in practice it still appears necessary to have several thousand policemen ready whenever there is a prospect of disturbance.‡

Again, it is contended that armies and navies should exist only to fulfil the function of the policeman. But the analogy in the case of nations is quite untenable. Citizens are more or less the same height and weight; nations are not. If nations are to be compared to citizen policemen, their population may be regarded as roughly equivalent to physical height. On this basis, Russia and the United States are 13 ft. high, Germany is 6 ft., France, Great Britain, and Italy are 4 ft. Holland is 9 in., and Denmark 4 in., and so on. How can citizens varying in height from 6 in. to 6 ft. co-operate as a citizen police force in coercing another citizen 13 ft. high?

And there is another circumstance which makes the "police force" analogy untenable. Each "citizen" of these varying heights can entrench himself in his own territorial estate, where he is able to fight at an advantage against the others. It may be contended, of course, that the feudal barons were finally put down, but they did not possess big guns or tanks, and the authority of the King was a potent factor in the contest. The tremendous disparities between nations in population, natural resources, industrial skill, geographical position, and organisation for war preclude the possibility of any comparison between the conditions governing the use of national forces and those of a police force.

In practice, too, there are very great obstacles to the constitution

\* J. B. Mozley, "Sermons," 1895.

† "Implications of Collective Security," Lord Davies, *XIX Century and After*, October, 1934; Letter, Lord Howard, *The Times*, March 28.

‡ As on September 9, 1934, at the Fascist meeting in Hyde Park.

of a special "police" force. Any force that is going to impose sanctions on Europe would have to be at least, say, 200,000 strong. Where is it going to be quartered? How is it going to be trained? Where is its artillery and aircraft to be parked? And last but not least, who is going to be its Chief of Staff? Of one thing we can be certain—that any system of "collective security" would impose heavy sacrifices on any peoples who are so idealistic as to believe that they can impose peace on a contentious and warring world. Nor can any one foresee the extent of the sacrifice. The obligation is an unlimited one. Even if England were prepared to earmark a quota of 100,000 men to the maintenance of peace, could it stop there? In 1914 six divisions was the quota to be sent to France, but by 1918 five million men of British birth had followed them.\* War cannot be limited, and no limit can be placed on one's commitments to war.

There are, besides, very serious constitutional difficulties in the way of automatic commitments to any scheme of "collective security." The Dominions, who compose in population something like a quarter of our strength, and whose harbours represent a large contribution to our sea power, may not subscribe to such commitments, in which case they would be bound to assume an attitude of neutrality.

Here one is confronted with another fallacy which has grown up in the last decade, namely, that the Kellogg Pact has abolished neutrality and that no signatory of the Pact can remain neutral against an aggressor. But no one with even an elementary knowledge of international law and of the scores of jurists, from Grotius and Gentilis down to Holland and Phillimore, Arntz, Renault, and Travers Twiss, who have written on neutrality can read any such meaning into the Pact. And it is most undesirable that any one should.

It is only some three centuries since Grotius and other jurists out of an inconsistent practice hammered out a more or less consistent doctrine of neutrality which has done much to canalise the devastating flood of war. Volumes have been written on it. A vast corpus of law has grown up round it. Does any one seriously think that this can be lightly thrust to one side in order to ensure that everybody will be fighting for peace in the war that is always going to end war. The whole conception of neutrality is in itself a dyke against war, and to imagine that by abolishing the idea of neutrality one will abolish war is, as the Arabs say, "to eat sand." The statements of Mr. Stimson in August, 1932, and of Mr. Norman Davis in May, 1933, certainly carry an implication that the rights of neutrality will not be pressed by the United States against Powers enforcing sanctions on behalf of the Kellogg Pact. But this does not abolish neutrality. It merely amounts to a waiver of its rights. And it is little more than a proposal. The Senate has not given it any definite confirmation.

\* Earl Percy (the late Duke of Northumberland) was the sole voice in the public Press to point out that the maintenance of six divisions in France would involve large reinforcements. (See *National Review*, 1914, vol. 63, p. 609.)

And there is another still more prevalent theory, namely, that when diplomacy has failed the great engine of economic pressure can take the place of the gun and bomb, and that in the event of any breach of a Disarmament Treaty the signatories should exercise the necessary economic pressure to bring the treaty breaker to reason.\* The advocates of this policy seem to assume that because economic pressure is a powerful instrument of warfare it can be imposed independently of a state of war. But anything of the nature of severe economic pressure on a leading Power must lead at once to a peremptory demand for its cessation, and so on to retaliatory measures (in areas favourable to that Power) which would quickly develop into a state of actual war.

To return to the Conference, M. Paul Boncour's ingenious plan of concentric circles of diminishing obligation having more or less fallen to the ground, Sir John Simon in Geneva at the end of May † endeavoured to save something for humanity by suggesting an agreement on the subject of chemical warfare, but the late M. Barthou in reply emphasised the point that for France the real and only problem was one of security. This led in June to a proposal by France of a scheme of mutual assistance embracing France, Russia, Poland, the Little Entente, the Baltic States, and Germany, with a second pact covering the Mediterranean. Italy regarded these pacts as merely instruments intensifying the policy of armaments and announced—not too helpfully—that she was going to lay down two battleships of 35,000 tons.

The Disarmament Conference then set up four committees, (a) on Security, (b) on Guarantees of Execution, (c) on Air, (d) on the Manufacture and Sale of Arms. Germany was not prepared to join in the Pact of Mutual Assistance and by July 1 was in the throes of her distressful crisis. On July 8, M. Barthou visited London. As Great Britain could not accept further obligations, France was intent on Russia entering the League, and M. Barthou was able to assure himself that Great Britain would assume an attitude of benevolence. One thing, however, was certain—there could be no further commitments. Sir John Simon, speaking in the House of Commons on July 18, stated emphatically ‡ that the negotiations meant no new obligations on the part of Great Britain.

The pacifist finds himself confronted with the dilemma that pacifism without armaments leads nowhere. In the end of July Mr. Baldwin, in the House of Commons, announced a new Air programme, quoting a statement of Lord Haldane in 1928, "that nothing could be accomplished with a diplomacy that is impotent for want of power behind it," and Lord Londonderry pointed out that "an Air Force as strong as other nations' would strengthen our influence for peace." It may be terrible to think that the terrible masses of paper issued by various societies inspire no terror abroad, but there it is.

Mr. Baldwin sounded a note of warning. There were dark

\* Lord Cecil at Brighton. *The Times*, February 5, 1934.

*The Times*, May 31.

† *The Times*, July 14, "uttered these words with tremendous emphasis."

clouds in the Saar, in Memel, in Germany, in Austria. He touched the weak spot of the pacifists who cry for collective security and denounce armaments. "Unless we have the means to carry out our obligations our contribution to collective security is meaningless and will be regarded as meaningless." Finally, in a fateful phrase he stated that "when you think of the defence of England you think of the Rhine."\* It is possible to add that there are obligations beyond the Rhine, which may be briefly summarised :

- The Washington Four Power Treaty of 1922 with regard to the Pacific.
- The Nine Power Treaty of 1922 *re* the territorial integrity of China.
- The Dardanelles Straits Treaty in 1923 to maintain the free navigation of the Straits.
- The Locarno Treaty of 1925 to defend the Franco-German frontier against aggression.
- The Treaty of 1930 to help Iraq in an emergency.
- The Declaration to Egypt of 1930 to defend Egypt against foreign aggression.
- And in February, 1934,  
A statement of policy on the integrity and independence of Austria.

The precise conditions and circumstances in which these Treaties would become operative may be uncertain, but it is certain that they represent policies which might resolve themselves into definite obligations requiring armed forces behind them.

Here comes the point of strain. The pacifist and the League of Nations Unionist are constantly and insistently denouncing not merely the use of armed force but the soldier, sailor, and airman. They become wrathful and aggressive if a boy in school is shown a picture of a battleship, a howitzer, or a tank, and almost choke with anger at the idea of military training in schools. The pacifist is thoroughly rude to all fighting men. He is faced with an insoluble dilemma. To abolish the army, navy, and air force in the present state of the world does not mean peace but merely national suicide, and the mass of the people are not suicidal. They are much more interested in the Football League than in the League of Nations. The road to national suicide being providentially closed, the pacifist flees to the ark of "collective security." Here he finds himself in a mass of *paperasserie* and drafts of complicated treaties which might be interpreted to mean that the British Navy, Army, and Air Force are to fight for Bessarabia or some unpronounceable place hitherto utterly unknown. The mass of the people can be inspired by phrases such as "King and Country," but words like Bessarabia or Memel leave them stone cold. *Il ne marcheront pas.*

There seems to remain nothing but the old way of sound diplomacy backed up by forces sufficient to protect one's legitimate interests against too easy aggression and to hold in check those who may place their hope in war.

Some may think that these matters lie outside the sphere of purely naval discussion, but it must be remembered that since the War the whole centre of gravity of discussion has shifted. With too many it is not a question of a Two Power Standard but of any standard at all. Fed on the dank pastures of propaganda, the

\* *The Times*, July 20, 1934.

younger generation is full of wind and inclined to forget that the old diplomacy, with a sufficient force behind it to make it respected, kept us for a century out of any great European war. What, then, is a sufficient force?

Here it is not out of place to review briefly the standards of naval strength adopted in the last fifty years. The 'eighties saw a great recrudescence of interest in the Navy, led by such publicists as Sir John Colomb, Sir James Thrusfield, Commander Charles N. Robinson, and Lord Brassey, whose service at the Admiralty led him to start the present "Annual" in order to supply what is the beginning of all sound policy—accurate information.

A Two Power Standard in relation to France had been proposed some twenty years before by Richard Cobden, and in 1885 Mr. Gladstone's Government set a standard of laying down two ships for every one laid down by France. Mahan's lectures from 1886 onwards, culminating in his work on "Sea Power" (1890), gave a great impetus to the study of the subject, and by 1889 the Two Power Standard had become an accepted policy of the Government. "I accept," said Mr. Campbell Bannerman, "in the fullest and most complete form, the doctrine that it is necessary for the country to hold the supremacy of the sea, and further, I accept the doctrine that the test and standard of this supremacy is that the Fleet should be as strong as the combined strength of any other two fleets in the world." \*

An element of ambiguity, however, crept into the phrase. Did it mean the next two most powerful fleets in Europe, or did it apply only to possible antagonists, such as the Dual Alliance, formed in 1891, of Russia and France? Did it apply to Europe only or was the United States to be considered? † Further, did it apply to battleships only, and if so what was the standard for cruisers?

In 1904 it was definitely stated that the standard applied to battleships only. The standard of cruisers was to be governed by the work they had to do and the interests they had to protect. "In the question of cruisers, the Admiralty cannot be governed solely by the Two Power Standard—the standard of strength to which they had to build was not a comparative one; it is a question of proportion to be considered in relation to the magnitude of the interests they have to protect." ‡

In 1908 Lord Tweedmouth introduced a modification when he stated that his predecessors had always taken the Two Power Standard to mean the two next strongest Powers abroad plus 10 per cent. §

By that year Germany had become the central figure in the picture. There was a long debate on the meaning of the Two Power Standard. Mr. Asquith stated that it was nothing more than "a purely empirical generalisation—a convenient working rule

\* Mr. Campbell Bannerman, April 1, 1889.

† Mr. Arnold-Forster, May 14, 1903.

‡ Mr. Pretzman, February 29, 1904.

§ Lord Tweedmouth, March 18, 1908.

of thumb," and Mr. Carlylon Bellairs asked that it should be measured with respect to Germany.\*

In 1912 came the announcement of a change. Mr. Churchill on March 18 stated that "the actual standard in new construction which the Admiralty has in fact followed during recent years, has been to develop a 60 per cent. superiority in vessels of 'Dreadnought' type over the German Navy." Somewhere then, about 1911, the Two Power Standard became one of 60 per cent. superiority in "Dreadnoughts" over Germany. It was this standard which carried us through the War. The cry for eight battleships in 1909 found its complete justification in 1916.

The next standard came from Washington in 1921—the standard of parity with the United States. The conference there must be regarded as a triumph of world diplomacy, but it left in France a residuum of dissatisfaction, and in the case of cruisers the endeavour to apply the scale was more difficult and the result less satisfactory.

On the other hand, it must be admitted that in the sphere of naval standards it has been possible to obtain a large measure of agreement, which has supplied a distinct contribution to the policy of disarmament. This agreement has, however, been gained by reducing our cruiser strength to the very low limit of fifty. Mr. Pretzman's statement on cruiser strength has been quoted and Admiral Sir Herbert Richmond reasserts the same principle. "The cruiser strength must suffice to furnish detachments in all positions in which they are required in strength sufficient to meet such attacks as it is reasonably possible to anticipate."† In other words, while battleship strength depends on the probable strength of the battle fleet of a possible antagonist, cruiser strength depends on the work they will have to perform. This work has not altered so greatly since the War as to render obsolete the requirements of that time.

The great progress in aircraft has brought about a considerable modification of outlook in the case of narrow seas and coastal waters, but not in the case of cruisers protecting oceanic trade. The strength of air power lies chiefly in its greater capacity to repel invasion and the menace it exercises in the case of bases less than 500 miles away. Air power has, however, a big riddle to solve. It can operate with great effect in limited areas, but if its main strength (as its principal exponents contend) lies in the power of retaliation and unrestricted warfare (explosive, incendiary, and chemical) on civilians, it is going to be faced with riddles of neutrality much bigger than those which confronted Germany in her unrestricted submarine campaign.

The trump suit of the powers of the air seems to lie in unrestricted and indiscriminate bombing of all and sundry—soldiers, sailors, women, children, gasometers, hospitals, churches, and embassies—but it was precisely this procedure in a milder form on the part of submarines which infuriated the world and brought the United

\* House of Commons, May 26, 1909.

† "Sea Power in the Modern World," 1934, p. 208.

States into the War. A big bomber that drops a 1,000-lb. bomb on a liner is going to repeat the history of U.20 and the Lusitania.

Nations that mutually adopt unrestricted bombing of great cities are bound to incur the hostility of the world, apart from the likelihood of revolutionary explosions in both countries, bent on the immediate conclusion of a peace in which the objects of the War would be ruthlessly jettisoned. So that unrestricted air warfare would lead on either side to nothing, or, perhaps, to too much. "To-night will unravel many a strange riddle," said Faust on his way by air to the Brocken. "Yes," remarked Mephisto, "and strange riddles may also be put to-night and not unravelled." Air power has yet to unravel the riddle of neutrality and humanity. The restrictions placed on submarines in the Treaty of London should logically be extended to aircraft, which are infinitely more deficient in the humane quality of genteel differentiation.

Submarines displayed in the War a great power of attack on trade unprotected by convoy, but their defensive power in coastal waters proved comparatively small. As a defence against invasion they must be regarded as immeasurably inferior to aircraft.

In the last thirty years naval politics has suffered a change of equilibrium, due more to extrinsic than to intrinsic causes—more to the awakened sense of sea power in other nations than to the phenomenal changes in ships and guns and instruments of war. In the nineteenth century the fleets of Great Britain and France, the only two great naval Powers, exercised an ascendancy on every ocean. This gave Mahan an exaggerated sense of its potency. It seemed to him ubiquitous because there was no one else in the distant spaces of the seas. But inspired by his doctrine, powerful navies have grown up in Germany, the United States, Japan, Russia, Austria, and Italy. This has introduced varying degrees of control, in other words, of sea power, in different maritime areas, because for each nation the waters round its great naval bases constitute an area of advantageous control. Thus the United States exercises an ascendancy on the American seabords and West Indies; Japan in the Sea of Japan and Yellow Sea; Great Britain and her Dominions in the North Sea, South Atlantic, and Indian Ocean. In the English Channel, an area common to Great Britain and France, air power could exercise an important influence. The Mediterranean is similarly common ground to France, Italy, and Spain, with Great Britain watching in the background.

To establish an ascendancy in a distant sea, controlled by the naval forces of another Power, would call for a fleet and resources much greater than those of the Power in question.

Maritime geography is in fact naval history, and is one of the most important factors latent in any comparative estimate of naval strength. Parity is not to be measured merely in numbers of warships. As Admiral Richmond says, "parity of naval strength is not necessarily parity of sea power, still less is it parity of security." \* The influence of geography is specially pronounced in the case of invasion, which requires a suitable preliminary base within easy

\* "Sea Power in the Modern World," p. 257.

reach of an enemy's coast. In this particular sphere the advent of air power has enormously increased the capacity for defence and, indeed, it may be doubted whether any invasionary attempt can hope for success in the face of aircraft working close to their own bases. On this hypothesis an invasion of Japan by America would appear to be as impracticable as an invasion of America by Japan. An invasion of European Russia to any effect would require resources so colossal as to be outside the bounds of practicability. Combatants far distant from one another will therefore tend to operate at a distance. They will not be able to strike home, their positions being analogous to that of Venice and England in the sixteenth century. Neither could touch the other.

In face of the greatly enhanced difficulty of invasionary attempts, operations in far distant waters will tend to resolve themselves into the form of an attack on trade or on some outlying possession, perhaps not so much for its own value as in order to draw one's opponent into a strategically unfavourable area. This proposition has two corollaries. First, it enhances the importance of a general naval agreement, for any approach to parity tends to ensure the security of particular waters from fleets and bases at a distance; secondly, in the event of war cruisers will certainly play an important part in the defence and attack of trade and a sufficiency of cruisers becomes a primary consideration. Air power, by diminishing the dangers of invasion, has left attack on trade routes as the principal line of effort oversea and has thereby enhanced the importance of cruisers, of which at present we are allowed only fifty.

But if the problem of standard of strength be set in terms not merely of cruisers but of the three arms, it is first necessary to arrive at some conclusion as to the direction and nature of our main line of war policy.

In August, 1911, so far as can be gathered from the War memoirs of the time,\* Admiral of the Fleet Sir Arthur Wilson had a conception that our main effort should be limited to the sea. We were to blockade Germany. Unfortunately, he also prescribed what the Army were to do, viz. land on the German coast, which evoked the reply that the Army was not in a position to do anything of the kind. Its plan was to land six divisions in France, and while Admiral Wilson sat silent the military plan was presented in illuminative detail. It omitted only one point of importance—that five million men would have to follow them.

Great Britain therefore had to bear an enormous military load on land in addition to the major burden of the War at sea. Our keynote at present seems to be the avoidance of any further Continental commitments †—not that we are unsympathetic to France or Europe, but because we simply cannot undertake obligations on land. We cannot enter on a vast and limitless military campaign without the wholehearted support not only of the whole nation but of the Dominions overseas. If they were not in the war, their

\* Sir Henry Wilson, Mr. Asquith, Lord Haldane, Mr. Winston Churchill, Sir Edward Grey.

† Sir John Simon, H. of C., July 13, 1934.



(Photo by Frank and Sons, South Shields.)

**H.M. DESTROYER ESK.**

*Commissioned for Service, October 2, 1934.*

*(By courtesy of the builders, Swan, Hunter and Wigham Richardson, Ltd., Wallsend-on-Tyne.)*



**H.M. DESTROYER ELECTRA.**

*Commissioned for Service, September 17, 1934.*

*(By courtesy of the builders, R. and W. Hawthorn, Leslie and Co., Ltd., Hebburn-on-Tyne.)*

NO MUNICÍPIO  
AVISORIALIA

harbours would be closed to us unless some new and ingenious form of neutrality were devised for the occasion.

On the question of standards it is difficult to say anything that has not been said before in the conferences at Geneva (1927) and London (1930) where a whole vocabulary of parity came into being—tonnage global or tonnage by categories—strength qualitative or strength quantitative—requirements relative or requirements absolute—parity numerical or parity equitable—weapons offensive or weapons defensive. It would be a work of supererogation to try to add to it.

Admiral Richmond suggests that parity might begin with *parité en bas* rather than *parité en haut*,\* in other words, that the datum of parity might well be the lowest naval Power (in this case Germany), and starting from this basis standards could be estimated for France and so on to Italy. There seems, however, no reason to believe that figures derived from *parité en bas* would be any smaller than those derived from *parité en haut*. As to the size of battleships, it may well be that there is much to be said in favour of a somewhat smaller ship, but in things material size means power and the construction by any nation outside the Treaty of a bigger ship would tend to dislocate any agreement of the sort.

A minor point with regard to the new Conference is the necessity of keeping in step the date of termination of the Washington and London Treaties. The London Treaty (1930) expires on December 31, 1936, but the Washington Treaty (1922) expires on December 31, 1936, only if one of the signatory Powers gives notice of its intention to withdraw before December 31, 1934; otherwise it runs on till two years have expired from the date of any such notice of withdrawal.

It is desirable perhaps, then, that one of the signatory Powers to the Washington Treaty should signify its withdrawal as soon as possible in order to bring the determination of the two Treaties into step.

Haunting every conference is the important issue of security, and more especially security against invasion by land, by sea, or by air. Here one may add a word on invasion by sea. Invasion, no doubt, is one of the sharpest weapons in the old armoury of sea power, but the immense clutter carried by a modern army is so vulnerable to attack by submarines and aircraft that invasion on a large scale against a defended coast may almost be ruled out as impracticable. Minefields too, protected by aircraft, constitute a potent obstacle to an invasionary approach. Sir Julian Corbett in his advocacy of amphibious warfare was only partly right. The power to carry an army oversea is one thing, the operation of landing it is another. Amphibious warfare is only powerful under strictly limited conditions. The essence of its strength lies in a surprise attack, by a Power which controls the sea, on an enemy with limited resources whose reinforcements can only come by sea.†

But if the attack is on an enemy's mainland, where he has the

\* "Sea Power in the Modern World," p. 213.

† The attacks on Samoa and on the Cameroons were good examples of this.

whole military resources of the country immediately behind him and the coast is adequately defended, amphibious warfare becomes not only weak but utterly impracticable, and all talk of the strength of conjunct operations and "amphibious warfare" becomes meaningless. Lord Fisher's idea of a landing in the Baltic could be regarded as impracticable.

The Dardanelles was a special case. Up to February, 1915, the Turkish forces in Gallipoli were limited and not capable of immediate reinforcement. This, then, was an admirable target for a sudden and surprise landing to seize the peninsula, which could almost certainly have been performed with the happiest results. But when the attempt was actually made the talisman of surprise (largely owing to Lord Kitchener's \* intervention) had gone and reinforcements were pouring in.

This short digression may serve to show the deceitfulness of historical theory. There can be little doubt that Lord Fisher in his Baltic scheme was misled by Sir Julian Corbett's gospel of amphibious warfare,† which at the Dardanelles led to a glorious but terrible repulse.

Our subsequent salvation was found in the old and tried measure of convoy, which few had deigned to study. Its efficacy still remains and its application means a sufficiency of cruisers and destroyers supported by a battle fleet.

Submarines proved a powerful weapon against shipping, but against modern warships their results were disappointing. No "Dreadnought" was sunk by a submarine.‡ On the other hand, it will probably be difficult to place limitations on any particular instrument of war or type of vessel, for a mechanised age is almost bound to use what mechanism it can, and smaller Powers tend to place an exaggerated value on the merits of submarines. There seems only one road out of the impasse, namely, to seek peace and ensue it on the road of sound and conciliatory diplomacy with a sufficient force behind it to inspire respect from those who may delight in war. No one can read the pages of Gooch and Temperley § without deriving therefrom a strong impression that for over thirty years the most powerful agent for peace in Europe was the British Fleet, and the most powerful agent for war the bellicose Continental press.|| But in spite of the fact that bellicose talk went on right through the nineteenth century Great Britain was only for three years out of ninety-nine involved in a Continental war.

\* It is interesting to note that Lord Esher in his Memoirs considered that on strategical questions Lord Kitchener was vague and indefinite.

† In his "Records" Lord Fisher gives a long memorandum by Sir Julian Corbett on the subject.

‡ Four German battleships were torpedoed, viz. Westfalen (April 24, 1916), Grosser Kurfürst and Kronprinz (November 5, 1916), and Moltke (twice, August 19, 1915, and April 24, 1918). No British "Dreadnought" was hit. Submarines sank 48 British men-of-war, including 5 older battleships, 9 cruisers, and 7 destroyers.

§ "British Documents on the Origins of the War," by G. P. Gooch, D. Litt., and Harold Temperley, Litt.D.

|| "A country which appears to have gone mad with jealousy, spite, and resentment." "A state of things which permits the most shameless insults to be heaped by the press," Sir E. Monson to Marquess of Salisbury, December 1, 1899. Gooch and Temperley, 1/242.

It is distinctly regrettable to find the Washington Treaty, one of the principal dykes against a rising tide of competition in armaments, giving way, but it has to be admitted that the Japanese attitude to some extent is only the natural reaction to the furious pacifist cry for "sanctions" against Japan in 1933. "Hell hath no fury like a non-combatant" says a well-known preacher,\* and the extreme pacifists will no doubt furiously denounce Japan for denouncing the Treaty. It is clearly, however, her intention to do so. She is opposed to the ratio of 5 : 5 : 3 which binds her up to 1936 to a battleship strength three-fifths that of Great Britain or the United States. She is anxious to come to a reasonable agreement based on the principle of a common upper limit,† and till that is decided is disinclined to consider any limits of number or type, or terms quantitative or qualitative. "Heavily falls the rain through the hat I stole from a scarecrow" says the Japanese proverb, and in 1934 the rain of reality is pouring heavily through the tattered demands for "sanctions" so furiously urged in 1933.

The more ardent followers of Geneva are aflame for machinery which will impose peace on the world; but can any one produce a workable model? In the different nations the authority of the Crown, usually after centuries of strife, was able to accumulate a sufficient head of supreme authority to establish the King's peace and enforce the King's writ. But where is a comparable authority and unity to be found in the body international at the present day? Failing it, there is only one main road—the old and well tried road of sane diplomacy striving to maintain peace, with sufficient defence, and a sufficient fleet behind it. Other paths seem to lead to desert sands of futility, or to impenetrable thickets of treaties or to bottomless bogs of commitments unlimited and illimitable.

ALFRED C. DEWAR,  
Captain, R.N.

\* The Very Reverend "Dick" Sheppard, in *St. Martin's Review*, December, 1933.  
† *The Times*, November 23.

## CHAPTER V.

### JAPAN AND HER NAVY.

#### INFLUENCE OF THE LONDON NAVAL TREATY.

THE people of Japan have an inherent and ever-present fear of outside interference as the result of their experiences following such successive events as the negotiations they were obliged to enter into with other countries by the use of armed force at the time of the Restoration ; the Sino-Japanese War, the interference of three countries on its conclusion ; the Russo-Japanese War of 1904-1905, and the difficult problems in the Pacific and Far East following the Great War. It is not to be wondered at, therefore, that the London Conference placed the Government of Japan at that time in an extremely awkward position.

During the ten years following the signing of the Washington Treaty the international situation underwent remarkable changes, and great strides were made in the science of warfare, particularly in regard to aircraft. It was the general opinion that the Washington Treaty, which was entered into when circumstances were anything but normal, was not suitable for the subsequent altered conditions. It was therefore strongly felt in Japan that the Treaty should be amended to meet these.

Nevertheless, the Japanese Government, being extremely anxious for a disarmament agreement to be concluded and to avoid a new race in naval construction, not only decided upon the continuance of the Washington Treaty, but went so far as to agree to the terms of the London Treaty, which was much more unfavourable to them in that it greatly restricted the construction of auxiliary naval craft, even if for a short period only. This created intense opposition in Japan, where the people's main thought was that the security of their country had thus been endangered for the sake of the financial policy following Japan's return to the gold standard.

In the national outburst of indignation which followed, several Japanese statesmen and financiers were murdered, whilst others were threatened with a similar fate, and for the first time in seventy years Japan experienced a state of internal dissatisfaction and anxiety. The following incidents in the history of Japan may be helpful in making more clear to those who take an interest in Japanese affairs the feelings of our people at that time.

#### HISTORICAL INCIDENTS.

Throughout the twenty-six centuries of Japanese history the most remarkable incidents were the invasions of Khubla-Khan in 1274

and 1279. If we take the invasion of England by the Spanish Armada as a comparison, the consternation of the Japanese people can well be imagined when its country was invaded by Khubla-Khan with a fleet of 4,400 ships of war and 140,000 soldiers, particularly so in view of the fact that at that time Japan had no navy, very primitive fortresses, and only antiquated weapons of war. It was only the indomitable bravery of the Japanese people, aided by the fortunate occurrence of a typhoon, which foiled this formidable invasion.

Three centuries later Japan fought Min, one of the greatest countries of that time, for the control of Korea. In spite of uninterrupted successes on land, the war ended disastrously, owing to the failure of its naval campaign. Even after such an experience, Japan remained indifferent to the need of a navy. From the beginning of the seventeenth century Japan entered into a state of national isolation under the Tokugawa Shogunate, and from then until the middle of the nineteenth century remained in peaceful ignorance of outside influence. During that time the sea-power of European nations became highly developed, and in comparison Japan was completely unprotected.

Towards the end of the seventeenth century Russian influence reached Kamchatka, after obtaining possession of the huge continent of Siberia, which formed the greater part of Asia. On numerous occasions during the century which followed Russia invaded and plundered Saghalin and Hokkaido, also invading and plundering the Kurile Island on the way. All of this territory belonged to Japan.

Special consideration should also be taken of the visit of Commodore Perry with four warships to Uraga in July, 1853, when he coerced Japan into commercial relations with his country. He returned to Japan in the following year and, against the wishes and protests of the Japanese Government, entered Tokyo Bay, forcing Japan to conclude a treaty of amity with his country by the threat of his huge ships, known in Japan by the name of "Black Ships." It was not long before Russia and Great Britain followed this example.

During the Tokugawa Shogunate it was the privilege and duty of each Daimyo in turn to visit the capital and remain there for three years, travelling there and back in full state. To interrupt such a procession was considered one of the greatest insults to the Daimyo, and was immediately punished with great severity. In September, 1862, some foreigners on horseback interrupted the procession of the Daimyo Shimazu near Yokohama, and three of them were injured by the Daimyo's retainers. The Shogun Tokugawa was greatly distressed at this incident, and in addition to tendering a full apology, paid the sum of £100,000 as compensation. The Ambassador of the country concerned was, however, not satisfied and claimed a further £25,000 requesting, in addition, that the retainers of the Daimyo who had committed the assault should be punished. These demands not being met, seven warships invaded the Bay of Kagoshima and bombarded Kagoshima City, which was almost completely burned out.

In August, 1864, the combined fleets of England, U.S.A., France, and Holland, consisting of seventeen warships, bombarded the Strait of Shimonoseki, occupied and destroyed all the fortresses ashore, and in addition received the sum of \$8,000,000, owing to trouble between the Tokugawa Government and the above countries.

The general world opinion of China is that she is not powerful and quite unprotected ; but the condition of that country fifty years ago was totally different from that of to-day. Just prior to the Sino-Japanese War, Admiral Ting-Lu-Chang visited Japan with the Chinese North Sea Fleet, which not only overawed the Japanese but also greatly impressed other countries. The fear of China becoming dominant in Korea, upon which country the safety and very existence of Japan depended, resulted in the Sino-Japanese War. In this conflict the tonnage of the Japanese Navy was 52,450 against China's 60,400. But the actual disparity was much greater than that, as in their Ting Yuen and Chen Yuen the Chinese Navy possessed two battleships against which the Japanese Navy had no comparable ships.

Fortunately we were victorious, and a small part of the Liao-Tung peninsula, including Dairen, was ceded to Japan as a guarantee of future security and confirmed by the Treaty of Shimonoseki. In spite of this, however, France, Russia, and Germany felt called upon to interfere in the settlement, and by the use of their combined fleets forced Japan to give up the fruits of its victory. The territory thus taken from Japan was later handed over to Russia.

A sequel to this was the entering into, in the spring of 1896, of a secret treaty between Russia and China whereby Russia was given complete rights of using the territory so ceded for administrative and military purposes, and also of building railways in Manchuria ; moreover, an alliance was formed between the two countries against Japan. Even so Russia was not satisfied and turned her eyes towards Korea. Thus once again, as just ten short years before, Japan was forced into war for the preservation of Korea, with the awful risk of complete disaster.

Japan found herself utterly impotent against the foreign influence which was pressing her from every side when she was awokened from her dream of three centuries by the armed forces of foreign powers. It should be apparent to all that since then the underlying principle of Japanese policy has been to endeavour to promote the equality of rights as between nations, and national security. Recognising her impotency in international affairs, it naturally followed that she should provide herself with Western weapons of war in order to have the means of maintaining her security. Although as the result of great efforts remarkable progress has been made towards improvement in international affairs, equality of rights as between nations and national security have not as yet, unfortunately, been obtained.

## NAVAL PLAN FOLLOWING THE LONDON TREATY.

From what has already been written, no difficulty should be experienced in understanding and appreciating the strong opposition raised in Japan to the terms of the London Treaty.

After the signing of the London Treaty the Japanese Government was in an extremely difficult position in its discussions with the Privy Council as well as in Parliament ; whilst the Government party, though very strong in numbers, was forced to make concessions to the opposition in order to placate them and the people of Japan, and at the same time outline its policy for nullifying the deficiencies from which Japan suffered as a result of the Treaty. Moreover, the Minister of Marine, who had been one of the delegates to the London Conference, was forced to resign before the next meeting of Parliament.

In such an atmosphere was the first urgent naval plan of 1931 prepared. Even so, at that early stage it was condemned as being inadequate, and the new Minister of Marine had to announce that a new plan was necessary and would be prepared immediately.

The first programme was as follows :—

## (a) Restricted vessels :

Type.	No.	Tonnage.
B. Class Cruisers . . . . .	4	33,800
Destroyers . . . . .	12	16,536
Submarines . . . . .	9	11,700

## (b) Unrestricted vessels :

Type.	No.	Tonnage.
Minelayers . . . . .	4	6,150
Torpedo Boats . . . . .	4	2,140
Submarine Tenders . . . . .	1	10,000
Other Craft . . . . .	8	3,600
	42	83,926

## JAPAN'S POSITION IN THE FAR EAST.

The Manchuria incident which occurred in 1931 gave rise to numerous disputes which were felt throughout the whole world ; most of them being fostered by abstract jurisprudence, or on account of countries interested each having its own particular axe to grind and being sadly misinformed as to the true state of affairs in the Far East, especially those directly concerning Japan ; or being misled by demonstrations which were not based on the actual state of affairs. To judge without knowledge of the subject is at all times a dangerous undertaking. Rarely, if ever, is the decision reached in consonance with the matters in issue. Japan, though standing well out in the Western Pacific, is relatively but a short distance from the mainland of Asia, and in consequence must feel the repercussions of every movement happening in Manchuria, China, and Siberia, in the same way that England is influenced by the smallest political and industrial movement taking place in the countries bordering the English Channel and the North Sea.

Japan's policy concerning Korea and Manchuria has ever been formulated with the main object of securing her national safety. If it were not so, it would be impossible to find any political reason whatsoever to explain why, in 1904-5, she was ready and willing to stake her very existence in the war against the vast and powerful Russian Empire, a war which 99 per cent. of the world confidently predicted would spell the complete annihilation of Japan. It was very evident at that time that the Russian Empire regarded Manchuria as the gateway to Korea and China. Sir Walter Raleigh once said : "I hope I shall never live to see the day when the French shall be masters of the Netherlands upon any conditions." Though the need of England to fear the weak Russian naval forces gathered in the Black Sea and the Bosphorus was slight, the mere fact that such forces were there was regarded in England as a grave menace to her interests in the Mediterranean. Even after the 1917 revolution, the menace of the power and influence of Russia remains unaltered so far as the security of Japan is concerned. As a matter of fact, Outer Mongolia, with an area almost seventeen times larger than Great Britain, is under the complete domination of the U.S.S.R., and has reached such a state that even China herself no longer is permitted any voice in the government and military affairs of her own territory. Having suffered from bitter experience within living memory, it is only natural that Japan should look with some apprehension on the presence of the greatest forces in the world, all consumed with the fever of revolution, gathered along the Russo-Manchukuo frontiers. From her geographical position Japan is largely dependent upon foreign supplies and cannot allow the slightest interruption to her communications with the mainland. Consequently, to maintain uninterrupted contact and to protect her interests there she has to rely upon an efficient Navy.

According to reports from reliable sources, Russia has for years planned to have a large standing submarine squadron at Vladivostok, and even to-day it is known that there are in commission there several powerful 1st and 2nd class submarines, whilst amongst the numerous aircraft operating in the Far East are included a number of powerful long-range bombing planes ready for use.

Thirty-one per cent. of the total Japanese imports in 1932 were from Asia, so it is only natural that Japan should observe very closely any movement likely to menace directly her communications with the mainland, which is regarded as of the gravest importance not only to her industries but to the very existence of the country. When Japan joined the League of Nations, created by the earnest efforts of President Wilson, she entertained no doubt that America would also join. As it happened, however, she did not do so, and Japan, left to bear the pressure from the two great countries outside the League—America and Russia—had to do the best she could, considering the feelings of even countries situated on the other side of the globe, to meet the troubles continually arising on the mainland.

Furthermore, Japan accepted the disparity ratio of 3 : 5 in naval strength laid down at the Washington Conference on the condition

that the defences of the Pacific would be limited ; but soon after the ratification of the Treaty, the fortifications of Hawaii and Singapore were strengthened under new schemes to such an extent as to render them almost impregnable bases of great strategic importance. Admittedly these two places are outside the areas covered by the Treaty, but to take advantage of that agreement to increase their fortifications round the area where peace has been promised, is certainly not the way to promote a friendly spirit among the Powers concerned.

#### ARMS IN CHINA.

With the armistice signed in 1932, a step towards a settlement of the Sino-Japanese dispute was made, and there is to-day evidence of a return to the old peaceful conditions. Due perhaps to insufficient effective control, however, professional boycotts, persecution of Japanese nationals, etc., still persist in various parts of China. If there should be any who would think of present-day China as a lamb unprotected and exposed to danger, they would be utterly bewildered by events in the Far East because, on the contrary, Chiang-Chieh-Shih's army alone totals the astonishing figure of 990,000, and can even be increased to 1,910,000 if we count the whole of the regular army stationed all over the country, and this is exclusive of the Communist Army of 850,000. It need hardly be mentioned that their training and equipment are not unified ; that they lack effective control ; and that, being scattered over a vast territory where communications are almost non-existent, they are frequently at war amongst themselves. These very conditions themselves make for unrest. Yet the quantities of arms and ammunition recently imported into China from abroad have reached huge dimensions. According to a statement in "The New Republic," the value of aircraft and accessories delivered to China from America during 1933 amount to \$2,240,000, including, it is said, 142 military planes.

From information recently received, the Curtiss-Wright Company of America have entered into an Agreement with the Nanking Government for the formation of an aircraft manufacturing company in Hang-Chow, and it is said that this Government have undertaken to purchase from the company sixty machines annually. It is also learned that interests in Germany have been commissioned to form a company with a capital of 3,000,000 Chinese dollars for the construction of aircraft at Lo-Yan, Honan.

TABLE I.—NUMBER OF AEROPLANES IMPORTED INTO CHINA TO MAY, 1933.

America . . . . .	241
England . . . . .	99
France . . . . .	31
Germany . . . . .	27
Italy . . . . .	59
Total . . . . .	457

NOTE.—It should be understood that in addition to these figures further importations were effected in secret.

TABLE II.—GUNS, AIRCRAFT, AND ACCESSORIES IMPORTED INTO CHINA.

	Rifles and Machine Guns.	Guns.	Aircraft and Accessories.
1932 . . . . .	52,200	240	126
Up to March, 1933 . . . .	1,200	290	80

TABLE III.—VALUES OF IMPORTS OF ARMAMENTS, AIRCRAFT, AND ACCESSORIES.

	Armaments, Ammunition, etc.	Aircraft and Accessories.
1929 . . . . .	Taels. 3,839,029	Taels. 1,793,125
1930 . . . . .	15,578,547	3,428,862
1931 . . . . .	12,125,677	4,519,998

Where 1 Tael = 1·4 Chinese dollars (rate of exchange of August, 1934).

#### THE SECOND NAVAL SUPPLEMENTARY PROGRAMME.

The explanation already given relates to only a part of the very complex situation in Eastern Asia, but it will easily be realised that the importation of foreign arms and ammunition by a nation whose militarists are continually in dispute, constitutes a grave danger to the peace of neighbouring Powers and is bound to create a feeling of serious insecurity and irritation. A matter which to a distant country may seem as a happening in another world, may, to a neighbouring country, be an occurrence seriously affecting her fate.

The export by European and American countries to the Far East of such warlike materials as machine guns, revolvers, ammunition, smokeless powder and the like, under such an innocuous label as "Kerosene," may not be contrary to any treaty. In the continent of China, with an area almost as large as Europe, there are many causes which keep the country in a continual state of unrest. Adding fuel to what may prove a disastrous conflagration really cannot be reconciled with the principle of the "Open Door" and is lamentable having regard to the peace of the world.

The situation in the Far East has changed considerably since the 1931 incident, and Japan, unfortunately, as a result of her views and those of other countries failing to be reconciled in what she considers to be for her a matter of life or death, has been left to endeavour alone to maintain peace in the Far East. Consequently, in the spring of 1934, the Diet was compelled to proceed with the prearranged naval programme, the so-called Second Naval Supplementary Programme, and the following recommendations were passed :—

## (a) Vessels under Limitation :

Type.	No.	Tonnage.
Aircraft-carrier	2	20,000
B. Class Cruisers	2	17,000
Destroyers	14	19,600
Submarines	4	7,480

## (b) Vessels Exempt :

Type.	No.	Tonnage.
Oil Tankers	2	30,000
Seaplane Tenders	3	30,000
Repair Ships	1	15,000
Torpedo Boats	16	9,600
Total	44	148,680

Also miscellaneous small vessels.

## CHANGES IN MODE OF LIVING IN JAPAN.

When Japan commenced her association with the outside world her population was 30,000,000, 80 per cent. of which was the farming class. Sixty years later the population had doubled, yet the farmer class accounted for only 48 per cent. Owing to the mountainous nature of Japan, only 16 per cent. of the land is fit for cultivation, almost the whole of which is now so employed. Because of the nature of the country and its population having reached saturation point, conditions of life had rapidly to be altered, and thus the people of Japan became industrialised. To meet these quickly changing conditions, resources from abroad had to be called upon, with the natural sequence that foreign markets for their products had to be found. Whereas previously Japan had been forced to associate with foreign nations, matters were now altered, and all over the world countries are closing their doors to the Japanese people and to Japanese products.

TABLE IV.

## PERCENTAGE OF VARIOUS MATERIALS WHICH JAPAN HAS TO IMPORT.

Cotton . . . . .	100 per cent.	Tin . . . . .	78 per cent.
Wool. . . . .	100 "	Crude oil. . . . .	74 "
Rubber . . . . .	100 "	Soya bean . . . . .	90 "
Nickel . . . . .	100 "	Dye-stuffs and chemicals	68 "
Sugar . . . . .	97 "	Pig-iron . . . . .	57 "
Timber . . . . .	96 "	Zinc . . . . .	49 "
Heavy oil . . . . .	93 "	Wheat . . . . .	46 "
Lead . . . . .	93 "	Leather . . . . .	45 "

The principle of the "Open Door" can be maintained by the use of Dreadnoughts, but the doors of the world to markets and immigration, protected by customs barriers and immigration laws, cannot be opened by international law. Moreover, even in Manchuria, where Japan had treaty rights, the "Open Door" was almost to be denied her. But the relations between Manchuria and Japan were clearly understood by the Japanese people, and because of the great sacrifices made by Japan in Manchuria, and in view of her established position there, it is quite impossible for Japan to

withdraw from Manchuria. It is not merely a question of dignity nor of prestige that Japan cannot withdraw from Manchuria ; rather is it a matter of life and death for 90,000,000 people.

It is said that Japan has territorial ambitions as the result of her Imperialistic designs ; but this is not so. It does not necessarily follow that greater territory will provide for the needs of her people ; rather is it probable that such increase may result in intolerable burdens being placed upon the finances of the country. As a matter of fact, all that Japan really needs and earnestly desires are trade and security. Japan cannot therefore but be concerned about her Navy as a means of assuring security in the Far Eastern seas, and for the protection of the world-wide trade now necessary for her very existence.

#### JAPAN AND DISARMAMENT.

Those who, whether deliberately or otherwise, failed to take account of the foregoing facts, pointed to Japan, after both the Washington and London Conferences, as the ringleader in the armament race. But when the relative nature of armaments is taken into consideration, it appears to be most illogical and the height of folly to charge a nation which has been shackled by treaty to a hopeless ratio, with the offence of being the chief instigator of the race in naval construction. To all projects looking towards the reduction or limitation of armaments Japan has always given unstinted co-operation ; even after she was obliged by force of circumstances to give notice of withdrawal from the League of Nations, she pledged her continued support to all international undertakings calculated to enhance the cause of world peace. And that pledge she is now carrying out in the strictest of good faith, just as she has lived up to every obligation assumed under the existing naval treaties.

In an article contributed to a recent number of the American magazine "Foreign Affairs," Admiral Pratt stated : "Since we are not closely surrounded by real or imagined dangers, we look upon disarmament with a broad, generous outlook. . . . We have made one serious error, however ; and that is, having made arms agreements in the past, we have not lived up to them. . . . Then when we find we are wrong we are forced to repair the damage. . . ."

Admiral Pratt's observation is one which deserves our careful thought. Navies are not built, in practice, as a means of surveillance of smuggling ships or for other similar purposes. The inherent function of navies is to defend against dangers that threaten from overseas. It is, therefore, not the length of coastline or the number of seas which a country touches that determine the size of its navy. Rather is it the degree of danger by which a country might be threatened which must determine whether a navy shall be large or small ; and it goes without saying that a country facing a difficult situation must always be equipped with a force adequate to cope with such a situation. Fortunate indeed is the country that can lay claim to a powerful navy simply to satisfy its desire

to order the world, notwithstanding that it be free from all external dangers.

The general public antipathy towards military expenditures should always be allayed in accordance with the forms and degrees of development of industries in the various countries. In a country so rapidly modernised as Japan, whose heavy industries are still in the initial stages of development, maintenance of the Navy plays an extremely important rôle in the wholesome development and prosperity of domestic industries. This fact becomes all the more obvious when it is considered that a large part of the military supplies in Japan is produced by small-scale factories distributed throughout the length and breadth of the Empire. How to save these manufacturing industries, virtually driven to the wall by the world-wide economic depression and the extreme retrenchment policy adopted by the Japanese Government round about 1930, became a question calling for urgent solution. The possibility of a suitable naval replacement programme to ease this industrial situation was naturally thought of; but this channel of relief was most effectively blocked by the restrictive provisions of the London Naval Treaty. It may thus be said that the London Treaty has been, in a sense, a serious blow to the industrial circles of Japan.

#### A TREATY ABREAST OF THE TIMES.

The argument advanced in some quarters seems to be that the authority of the existing naval treaties is so absolute that they should be maintained in perpetuity, wholly unaffected either by the passage of time or changes in circumstances. But that would be tantamount to warning independent Powers against the entanglements of international agreements. The existing naval agreements were doubtless based on the conditions prevailing at the time they were concluded, provision being made therein for steps to be taken for their abrogation when the treaties themselves should no longer be in keeping with changed conditions. It would, indeed, be impossible for any nation to enter into a treaty which imposes an unalterable and permanent obligation. In this connection, the utterance of Mr. Ramsay Macdonald, "Every treaty is holy but no treaty is eternal," is enlightening. This may be considered as the expression of an eternal truth.

There are some, also, who would point to Japan's desire to have the existing naval treaties abrogated or revised as presaging Japan's designs on sea areas outside the Orient. Nothing could be more groundless or absurd! The Japanese Navy has never entertained the ideas of action in distant waters—its sole mission being the defence of home territory. It is difficult to understand why a Navy, upon whose shoulders rests the very existence of the nation, must be content with a strength distinctly inferior to that of navies whose chief concern is the defence of colonial possessions or trade routes.

The denial of the right of equality in national defence among civilised nations to-day is an injustice which can neither be explained away nor defended. Especially is this true at a time when even the

provisions of the Versailles Treaty relating to military restrictions are being reconsidered with a view to their revision. In the past Japan acquiesced in the allocation of an inferior strength because of her lofty desire to facilitate the work of disarmament and to contribute thereby to world peace. But her sacrifices have all been in vain. Far from seeing their expectations materialise, the Japanese people have only suffered a further injury to their sense of security ; and it is now clear beyond all doubt that the naval strength allowed by the past treaties is wholly inadequate for the maintenance of order and stability in the Far East.

Nowhere in history can we find an instance of the civilised nations enjoying peace for any great period as the result of one race being subjected to unequal treatment by another. In view of the inherent nature of naval armaments, the primordial need is to have all nations assured of their national security. All offensive armaments should be abolished in favour of defensive armaments ; and a common limit should be fixed, within which all nations would be free to build to the point which they consider adequate in the light of their respective circumstances and needs. In other words, little contribution can be made to the cause of disarmament unless the nations can enjoy equality of security and autonomy in respect of national defence. A treaty which can have the result of enabling a country, for the purpose of acquiring markets abroad, to menace the very existence of another country located thousands of miles away cannot be considered as fair and just. Great Britain and the United States to-day possess 170 per cent. of the naval strength of Japan ; and yet there are some who contend that Japan's naval strength is excessive. Unless there is readiness on the part of nations with superior navies, or which face few difficulties or dangers, to make voluntary sacrifices, the lesser Powers will be left in a state of such constant restlessness and insecurity that whatever benefits might otherwise accrue from disarmament would be lost.

Conceptions of morality and justice vary with time, place, and peoples. If one race assumes the position of arbiter of world peace and morality, and attempts to impose its decisions on other races, if necessary even by the use of force, the world will never know respite from chaos and disorder. It is indeed a great thing for the world, as Senator Borah once said, that different peoples, different civilisations, and different political ideas can exist side by side.

S. TAKAGI,  
Commander, I.J.N.

## CHAPTER VI.

### NAVAL MANŒUVRES OF 1934.

#### BRITISH.

STRATEGICAL and tactical exercises are carried out to-day on practically every occasion of the fleets being at sea, but only a few of these are allowed to be witnessed by representatives of the Press and described for the benefit of the public. Tactical exercises, indeed, do not lend themselves to popular exposition, since their interest and the lessons to be learnt from them derive from careful analysis of accurate records of movements, signalling, gun and torpedo fire, and the technical procedure of fighting a man-of-war, which are neither released to the public nor would be intelligible to them if they were. But strategical exercises are of interest to all, and it is these chiefly that the Press have been allowed to witness.

The largest and most important strategical exercises of the year was that carried out in the Atlantic in March, in which the whole Home and Mediterranean Fleets took part. The two opposing fleets were constituted as follows :—

RED (BRITISH).	BLUE (ENEMY).
Mediterranean Fleet.	Home Fleet.
5 Battleships.	5 Battleships.
3 8"-gun cruisers.	2 Battle cruisers.
4 6"-gun cruisers.	8 6"-gun cruisers.
2 Aircraft carriers.	1 Aircraft carrier.
27 Destroyers.	19 Destroyers.
5 new Submarines.	4 old Submarines.

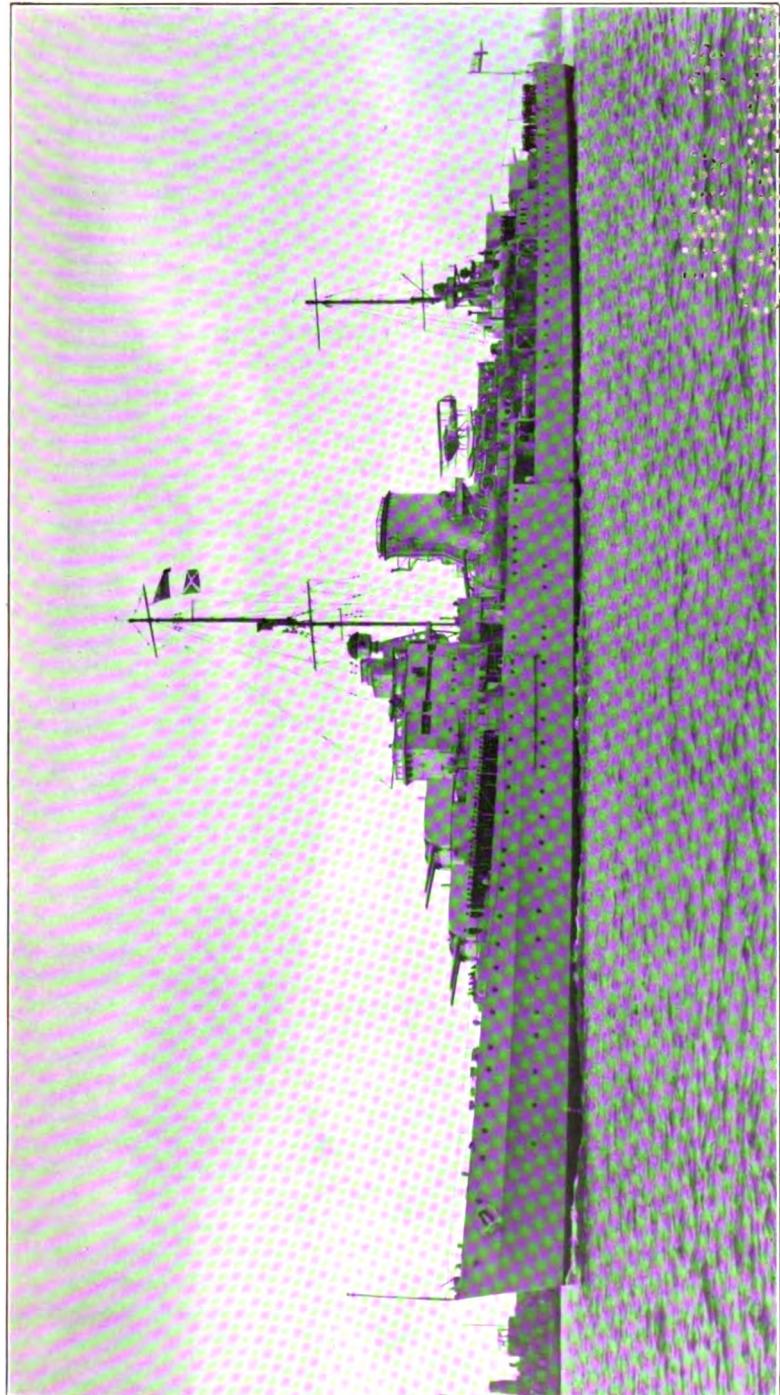
The war was supposed to have been in progress for some time. Blue, the enemy, inhabited an imaginary continent of which the north-east corner was in the position of the Azores. His object was to raid Red trade, but his base was too far away for him effectively to attack it between Gibraltar and the Channel, where the bulk of it was passing. He had therefore arranged with the neutral Government of Eastland, whose territories occupied the positions of Spain and Portugal, that no opposition would be offered to his seizure of a base on their Atlantic coast. This the Blue government decided to do, and the whole Blue fleet was ordered to escort the expedition. Blue's intention became known to Red, whose Mediterranean Fleet was ordered to Gibraltar, with orders to intercept the expedition and prevent its reaching the Eastland coast.

There are only two harbours on the Atlantic coast of the Iberian Peninsula which would be suitable for Blue's purpose—Arosa Bay in Spain and Lisbon in Portugal, 250 miles apart. Both are equally well placed for attack on the trade route, but the latter is only 250

miles from a Red base, Gibraltar, and would be much more subject to attack by Red, to surveillance by Red submarines, and to interference by Red with its supplies, all of which must be brought from Blueland. Blue therefore decided upon the northern port as his destination. In order to get his convoy there intact he relied chiefly upon evasion. He routed the convoy as far north as time would allow, so as to take it as far away as possible from the direction from which any Red attack on it must come, and he arranged for it to do the last 100 miles of its passage during the dark hours. His battle fleet with its destroyer screen was to be kept within 50 miles to the south-eastward of the convoy, and on the second day out he intended to detach his battle cruisers, some cruisers and his aircraft carrier to the southward, in order to mislead Red as to his real intentions, but to be ready to rejoin him when ordered. Blue battle fleet was superior to Red's, even in the absence of his battle cruisers, by reason of its including the Nelson and Rodney, and he could count upon Red's cruisers being dispersed, in the early stages at least, so that the battle cruisers should have a good chance of destroying them in detail.

Red's task was difficult. He was aware of Blue's general intention, presumably through his intelligence service, and he could count on receiving early information of the sailing of Blue's expedition from the Azores. But he did not know which of two destinations 250 miles apart Blue might select, and the force at his disposal was not sufficient to cover all the possible lines of approach to both. Air reconnaissance might enable him to extend the area he could observe, but the use of aircraft from carriers in the Atlantic at that time of year is not always possible. The enemy's force was superior to his own, except in destroyers and aircraft.

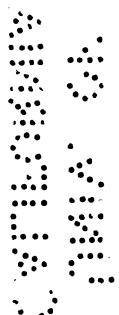
In these circumstances he decided to cover fully the approaches to one of Blue's possible destinations only, and also, wisely as it turned out, not to make his dispositions dependent for their efficacy on aircraft reconnaissance being possible. The strategical advantages to Blue of Arosa Bay as compared with Lisbon were just as obvious to him as to the Blue C.-in-C., and moreover, Blue's possession of the former would be much more damaging to Red than the latter. He therefore decided to spread his cruisers and destroyers, except the anti-submarine screen for his battle fleet, on a line N.N.E. and S.S.W., at right angles to and covering Blue's possible lines of approach to Arosa Bay. His three 8-inch gun cruisers, which would have the farthest to go, would be at the northern end of the line, which would be prolonged to the southward by submarines, so as to cover a part only of the possible courses of approach to Lisbon. The line was to be in position at daylight on the second day after he heard of the sailing of the Blue expedition, was to sweep to the westward during the day, retiring during dark hours, ready for a similar sweep the following day. If weather permitted flying, aircraft would reinforce the search, the aircraft carriers remaining under the protection of the battle fleet, which would cruise some 70 to 100 miles to the eastward of the look-out line. There were 25 ships available for the look-out line, and they were to be 12 miles



(Photo by Wright and Logan, Southsea.)

H.M. CRUISER NEPTUNE.

*Commissioned at Portsmouth, February 24, 1931.*



apart, covering a front of 300 miles. Their orders were that, should the Blue battle fleet be sighted, sufficient destroyers to ensure not losing touch with it were to shadow, while the remainder searched for and attacked the convoy, which it was anticipated would be found some 30 miles to the north-westward of it.

The Blue expedition sailed from the Azores at 8 p.m. on Saturday, March 10, and Red was informed of its sailing four hours later. Red immediately sailed to carry out his pre-arranged plan. Two of his 6-inch gun cruisers, however, had broken down and were unable to leave harbour, and later one of his 8-inch gun cruisers also developed defects which necessitated her returning, so that his look-out line was seriously weakened from the start. Moreover, on rounding Cape St. Vincent he encountered a heavy north-westerly gale, against which his destroyers could make no more than 5 knots. The line was thus twenty-four hours late in getting into position, and had therefore to be shifted an appropriate distance to the eastward. There were no further casualties from the heavy weather, however, and no other change was made in the plan.

Blue should not have suffered so much from the gale, which was abaft his beam, whereas it was dead ahead for Red. But as a matter of fact his destroyers, who in the General Idea were supposed to have sailed with him from the Azores, had actually been at Lagos in Portugal up to the opening of the exercise, and were to have joined him at sea on the morning of Monday, March 12. The flotillas of the Home Fleet were composed of the older War-built destroyers, and they could not face the gale, which was more violent to the westward. They became scattered during Sunday night, and some of them having sustained damage, they had to run for shelter to Lagos and Lisbon, taking no further part in the exercise. Moreover, the depot ships Lucia and Cyclops and the netlayer Guardian, which were to have represented the convoy, were also delayed coming from Lagos. The former broke down altogether, while the two latter missed the rendezvous and followed on some 30 miles behind the convoy, which was thus represented only by the small oiler Serbol. Blue, however, did not modify his plan, except to keep his battle fleet and aircraft carrier in close support of the convoy, for he realised that the impossibility of air reconnaissance on both sides was in his favour, and calculated that the gale which had driven his destroyers to seek shelter must have had the same effect on Red. As arranged, his cruisers and battle cruisers went off to the southward; indeed, he could not cancel their movement without betraying his position by a wireless signal.

The battle cruisers were duly reported by one of the Red submarines at dawn on Tuesday, March 13, at the extreme south of the look-out line, on the direct course from the Azores to Lisbon. They were shadowed by a division of Red destroyers from the south end of the line, but the Red C.-in-C. made no other change in his dispositions pending further news. At 10 a.m. the Shropshire, northernmost ship of the line, reported the Blue battle fleet, on the most northerly route that the convoy could be taking if it were going to Arosa Bay. All the remaining Red destroyers turned

north to carry out their original orders. But throughout the day there was no more news of the Blue convoy which might, for all Red knew, be behind either of the two Blue heavy forces, or even in the wide gap now opened between them. The Red C.-in-C. therefore held his central position. Had it been a real convoy, the cruisers and destroyers shadowing the Blue battle fleet must have observed and reported it ; but the small oiler Serbol escaped their observation.

Towards evening, the Red C.-in-C. realised that the Blue battle cruisers could not rejoin their battle fleet before daylight the following day, whereas it was possible for him to make contact with it shortly after midnight. He decided to do so, calculating that the advantage of surprise should be in his favour and that he was unlikely to get another chance of engaging a superior enemy on favourable terms. He therefore steered to intercept the Blue battle fleet, correcting his approach shortly before contact by ordering one of his flotillas which was in touch with Blue to make an attack ; and he brought his whole battle squadron simultaneously into action at a range of 7,000 yards against one flank of Blue, who had disposed his battleships and cruisers round the convoy in order, as far as might be, to shield it from torpedo attack. The exercise was then brought to an end.

Red's success in these manœuvres was brought about by three factors—the seaworthiness of the modern destroyers and the good seamanship of their officers and companies ; the sound strategical judgment of the C.-in-C. and his refusal to allow it to be deflected in a confusing situation ; and the high standard of his tactical skill. Blue's lack of success on the other hand cannot be attributed to the lack of the latter two qualities. He was committed by political pressure to an operation—that of conducting a convoy across 800 miles of sea in the face of an active and undefeated, if inferior, enemy—an operation which many would adjudge from the military point of view to be unjustified. He had experienced the worst of the weather, but he had no reason to suppose that his opponent's small craft would have made any better weather of it than had his own. Had Red too been deprived of all destroyers Blue might well have succeeded in his task, for Red, with only two ships available for reconnaissance, could not have accomplished what he actually did with twenty-five. Blue was completely justified in persevering with his task up to the time that it was clear to him that his enemy's destroyers were at sea in force ; after that, in real war he would undoubtedly have abandoned it and returned to his base, but in peace manœuvres for which only a limited time is available that would have been to abandon an opportunity for useful exercise.

The Navy has good reason to be satisfied with the performance on both sides ; but it has every reason to be dissatisfied with a provision of material which relies largely upon over-age ships as the equivalent of modern ones.

## FRENCH MANŒUVRES.

Manœuvres were carried out in the Mediterranean and Atlantic separately. The details of the former were not made public, nor were those of the first of the three parts into which the latter were divided; but in the second and third parts of the latter Press correspondents were embarked, and fairly full accounts appeared in the newspapers.

Most of the naval problems which exercise the minds of the French seem to be connected with the transport of troops from Africa to France, and the central idea of these manœuvres was the passage of a convoy, supposed to have come from Casablanca, and to be making for Bordeaux. The convoy consisted of one sloop, with one battleship, represented by the Jules Verne, and several destroyers as close escort. The French forces, consisting of those normally stationed in the Channel and Atlantic bases, were called the Blue Fleet. It comprised the Duguay Trouin, 6-inch gun cruiser, nine flotilla leaders and twelve submarines, of which only five appear to have actually taken part. In addition there were all the aircraft based on the western coast and the new big 4-engined flying-boat Croix du Sud (which recently participated in setting up a speed record for the air mail from South America), which has a flying endurance of 8,000 miles.

The enemy (Red Fleet) consisted of the Foch, representing a battle cruiser, and the cruisers Tourville, Colbert, and Dupleix. Most commentators on the manœuvres assumed that the enemy battle cruiser represented a German "pocket battleship," since French naval circles are well known to be much exercised by the problems that the existence of these ships presents to them. The German Press, however, which evinced great interest in the manœuvres, was at pains to demonstrate that it really represented a British battle cruiser, and interpreted the form given to the manœuvres as evidence of French preoccupation with the "British menace"!

The exercise began on May 15, when the initial positions were as follows:—

The convoy with its escort was off the coast of Portugal, making for Bordeaux. The remainder of the Blue Fleet was at Brest.

Of the Red Fleet, the Foch and Tourville in company were to the north of Brest. The Colbert was returning from a raid off Ireland to join them, as was the Dupleix from a similar mission in the vicinity of Gibraltar. Neither of the cruisers was considered capable of attacking the convoy by herself, owing to the presence of the Jules Verne, but whether this disability was imposed by the rules or was the result of the judgment of the Red commanders, does not appear.

On May 15 reconnaissance at sea was carried out by shore-based aircraft with the object of locating Red, but the weather was thick and they sighted nothing. The Dupleix, however, was located by her own action; for she bombarded Le Verdon, at the mouth of the Gironde—a curious proceeding, for it is difficult to understand what

military advantage she could hope to gain from it. In war, a cruiser far from her base would hardly expose herself to damage from shore fortifications or coast-defence submarines when her services were shortly to be needed for important service at sea ; and if there were no fortifications, the bombardment could produce no military effect whatever.

On the following day, May 16, visibility was even worse, and the shore-based aircraft did not leave the ground at all. Although there was little wind, there was a good deal of swell, and the seaplanes carried by the Blue ships which by then were at sea, were also unable to fly. The Blue admiral, however, was informed of Red's positions, but it was not made public whether they were located by wireless fixing, or whether the information was given deliberately in order not to upset the scheme of the manœuvres, in which Blue was chiefly dependent upon aircraft for reconnaissance. The Foch and Tourville were still to the north of Blue, and the Colbert in such a position that she must succeed in joining before she could be intercepted. The Dupleix, however, was still southward of Blue, who concentrated his efforts on intercepting her, but failed. It seems that Blue, having failed to intercept the Dupleix before she joined the Foch, held on to the south-westward in order to give closer support to the convoy.

At dawn on May 17 Blue joined the convoy, apparently unexpectedly, since they were at first taken for the Red forces ; though it is not clear whether any engagement actually took place before recognition. This incident illustrates, as did the British exercise in March, the unreality introduced into peace exercises when a convoy is represented by one small ship. At 7 a.m. the weather cleared. The sea was calm, the weather clear, and all Blue aircraft went up, including the Croix de Sud, which joined the Blue Fleet at 10.15. At the same time another plane reported Red 50 miles to the northward steering south at full speed. The Blue admiral at once ordered the convoy to Bayonne instead of Bordeaux, and disposed his force to the north and north-eastward of it. He must have parted company with it before this happened, for Red is reported to have gone too far to the westward to be able to intercept it. But it cannot have been very far away, since it was reported to have been concealed by a smoke screen put up by the destroyers of the close escort.

Action was joined between Red and Blue at 15,000 metres range, and seems to have taken the form of a running fight, since attacks on Red by Blue submarines had a part in it. At 12.40 the nine Blue flotilla leaders made a concerted torpedo attack on the Foch, and the convoy being then considered out of danger, it was rediverted to Bordeaux. The exercise then terminated.

The official result is not known. The views of Press correspondents as to which side had the best of it varied according to the side in which they were embarked. It seems clear, however, that light forces, aided by shore-based aircraft, managed to foil the attack of fast and more powerful forces on a convoy in the open sea. If so, French policy in providing a navy consisting chiefly

of fast light craft is justified ; but if not, their policy in laying down the Dunkerque is equally sound.

The last part of the manœuvres consisted of a combined naval and military exercise on May 31, in which a military force, including tanks, was landed on an open beach south of Sarzeau on the Peninsula of Ruis. The force landed consisted of two infantry regiments, a battalion of Fusiliers Marins, landing parties from the four cruisers which brought the troops from Lorient, 30 miles to the northward, together with artillery and tanks. The latter were brought only from Quiberon, where they had been loaded into special lighters the night before. The defending force consisted of a concentration of the troops normally quartered in the district.

The weather was calm, and boat work seems to have been easy. The four cruisers arrived off the selected beach, which is 1,500 metres long, at 3 a.m. and began to land at once, the tanks from their special lighters being among the first put ashore. The landing was observed by look-outs and the defence was immediately warned. Troops were rushed to the scene by motor transport, but could not make any progress against the tanks, which appear quickly to have secured a covering position, so that the landing could proceed without close opposition. At dawn, a thick fog came up, which prevented all flying by the defence, and made artillery useless. The attacking force was all established ashore by 11 a.m.

It must be admitted that the elements were on the side of the attack. The clearness of the night made the location of the beach a simple matter. The calm sea made possible the short tow from Quiberon of the tanks in their lighters, and facilitated the landing of both them and the troops on an open beach. The fog, which would have prevented the landing altogether if it had come on earlier, provided a shield against the chief weapons of the defence, artillery and aircraft, just when it was most needed. *Le Yacht*, of June 23, commented on the manœuvres as follows :—

A large participation of the naval air force had been anticipated in these exercises; unfavourable weather, however, considerably reduced it. Some days before, at Bizerta, a large exercise in which numerous planes were to figure could not take place because of bad weather. Finally, for the last part of the naval manœuvres on 31st May, about 100 land planes had been gathered under the command of an Air Force General; and the planes or seaplanes of the cruisers, of the "Commandant Teste," and of the 2nd Maritime District were also ready to go up; a fog unfortunately prevented them from doing so. Doubtless this contretemps is a useful reminder that the air service is a fine weather arm on which it is prudent not to count too much.

#### ITALIAN MANŒUVRES.

The Italian naval manœuvres reported by the Press, which took place in the presence of Signor Mussolini on August 6 and 7, consisted of gunnery, torpedo, and tactical exercises only. They are chiefly of interest for the fact that the oldest ship of those that took part in them joined the fleet in 1927.

On the first day, firings were carried out by all ships with their main armaments at a rocky islet, and with anti-aircraft guns against

balloons. The submarines also made attacks on the cruisers. On the second day, the ships were divided into two squadrons :—

1st Squadron.	2nd Squadron.
Zara	Bande Nere
Gorizia	Colleoni
Pola	Di Guissano
Fiume	Cadorna
Bolzano	9 Flotilla Leaders.
Trento	1 Aircraft carrier.
Trieste	9 submarines.
2 Destroyer Flotillas (each 1 leader and 8 Destroyers).	

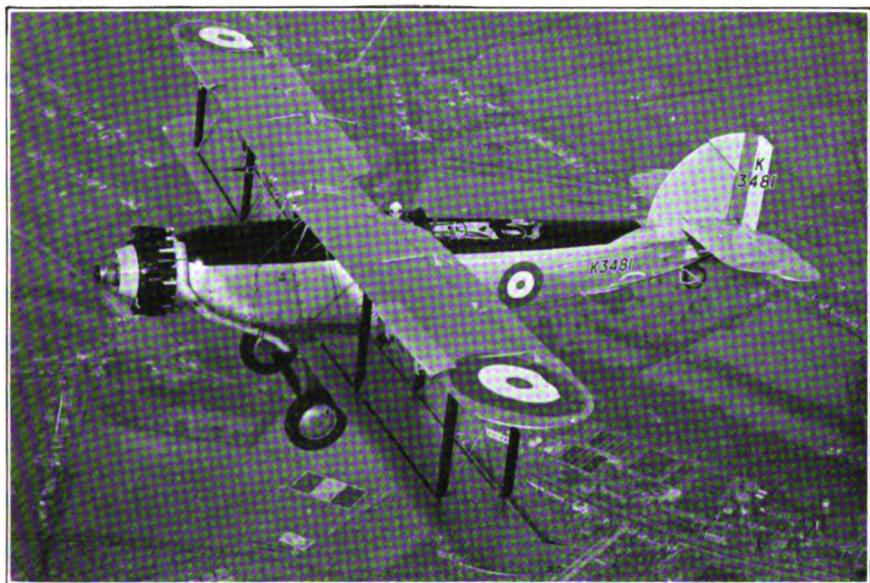
The 2nd Squadron was supposed to have fought an action in which damage had reduced its speed, and to be endeavouring to rejoin its main fleet ; while the 1st Squadron was to bring it to action before it could do so. Six reconnaissance aeroplanes were catapulted from the ships of the 1st Squadron, and reported the position of the enemy while still 25 miles away. The 1st Squadron pursued and a running fight ensued. The 2nd Squadron also catapulted its planes, which attacked the heavy cruisers of its pursuing enemy, presumably with bombs and machine guns. The flotilla leaders of the 2nd Squadron attacked the destroyers of the 1st, which were disposed on an anti-submarine screen, presumably to make an opening for submarines to attack the heavy cruisers. There is no mention, however, of submarine attacks. After an hour's action the main fleet upon which the 2nd Squadron was supposed to be retiring was announced to have been sighted. Whereupon both Squadrons broke off the action under the cover of smoke screens.

The Italian Press, with marked unanimity, stated that the exercise had shown clearly how necessary it is that cruisers should have battleships on which to retire.

#### AMERICAN MANŒUVRES.

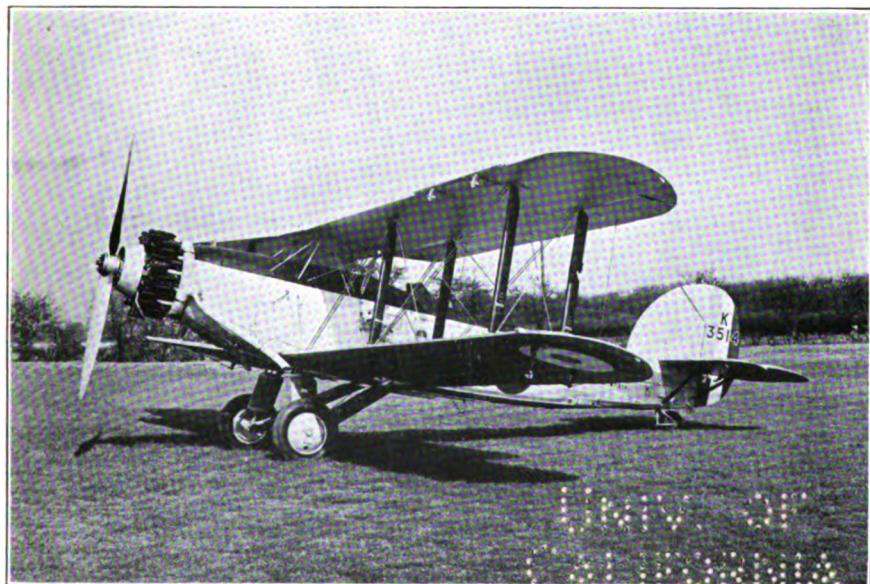
Manœuvres on a large scale took place in April and May, 1934, in the course of which the whole fleet left its usual bases on the Pacific Coast and cruised into the Atlantic, where it was later on reviewed by the President. After various exercises on the passage south from California, which were not reported in the Press, the usual attack was staged on the defences of the Panama Canal. The Blue side consisted of the Canal Defence Forces, reinforced by submarines ; the Brown side consisted of the Fleet. Apart from the operations of submarines, operations were wholly conducted by aircraft.

Brown entered the Gulf of Panama just after dark on April 20, and the aircraft carriers remained about 90 to 100 miles from Panama. The first attacking squadron took off from the carriers half an hour before sunrise, and attacks on the main air base of the defence are reported to have caught machines in the open, and to have been very successful. Later on attacks were made on the Defence H.Q., which removed to an alternative position. Bombing attacks were also made on the locks both at Miraflores and Gatun, but the



THE FAIREY SEAL.

(*By courtesy of "Flight."*)



THE FAIREY SEAL FLEET SPOTTER RECONNAISSANCE AIRCRAFT.

*Armstrong "Panther" Engine.*

(*By courtesy of the builders.*)

TO VIMU  
AMAROTLA

attackers were said to have presented very good targets to the anti-aircraft guns of the defences.

The defending planes located the aircraft carriers 100 miles out at sea, and dropped large bombs on the Lexington while she had many planes on deck. The small aircraft carrier Langley, too, was claimed to have been sunk by bombs, but contested the claim on the ground that her fighters defeated the attacking bombers. It may be conjectured that she received warning of impending attack, and had her fighters in the air in time. The Lexington was also torpedoed by submarines. No mention appears of attack, successful or otherwise, on the Saratoga, and the existence of the fixed guns of the shore defences appears to have discouraged any bombardment by the fleet.

After the passage of the Canal, which was carried out as a test of war organisation for quick transit, the fleet was divided into Blue and Grey for an extensive exercise in the Caribbean. Blue, under Admiral Reeves, Commander of the Battle Force, had seven battleships and the two big carriers, together with shore-based aircraft and the airship Macon. Grey, under Admiral Brumby, Commander of the Scouting Force, had four battleships and the Langley. Both sides had cruisers and destroyers. The general idea seems to have been that Grey, the enemy, had captured certain bases in Porto Rico and the Virgin Islands, and was using them for the attack of American trade in the Caribbean. Blue, the defenders, despatched an expedition, starting from Port Limon in Costa Rica, to recapture them, defending it on passage with its whole naval force, assisted by shore-based aircraft working from Guantanamo, and the airship Macon.

Blue sailed from Port Limon, with his convoy, at daylight on May 5, and the operations were continuous until the evening of May 10, when his expedition was landed at Culebra. He was harried by attacks from Grey throughout the passage, some torpedoes being put into the convoy by Grey destroyers on the first night out. On one occasion the Grey battleships attacked the stronger Blue squadron with the advantage of the light, and were adjudged to have inflicted damage without sustaining it themselves. On another night Grey destroyers sank three Blue battleships with the loss of twenty of their own number. The Macon did useful work in scouting when she first joined the Blue fleet, but was put out of action by Grey planes the same day. Both Blue aircraft carriers were sunk early in the exercise, one by Grey planes, the other by cruisers.

The shore-based planes did good work in scouting. In the course of their exercise they shifted their base from Guantanamo to Haiti, but the ship that was establishing their advanced base was caught in the act and sunk by Grey cruisers.

For the landing, the Blue admiral divided his battle squadron on the day preceding it, one part to make a feint while the other covered the real landing. The latter was attacked by Grey destroyers during the night, and so damaged that the former had to be recalled to reinforce it for the real landing. Before it could rejoin, it was

engaged by the Grey battle squadron, and would have been severely handled, but that Grey had to break off the action through shortage of ammunition.

In details, these exercises appear to have been realistic, and to have provided valuable training for all who took part in them. Operations covering 1,200 miles and extending over a week provide conditions for torpedo craft that approximate more to those of war than is generally the case in peace manœuvres, which are often unduly limited both in space and time. But it seems doubtful, as it was in the British manœuvres, if Blue's action in taking a convoy across 1,200 miles of sea in the face of an active enemy, as skilfully handled as was Admiral Brumby's force, is one that would really be undertaken in war. That, no doubt, is the conclusion to be drawn from the course the manœuvres actually took.

#### JAPANESE MANŒUVRES.

The Japanese manœuvres this year were on a large scale, employing the whole fleet; but no details were made public. The Press published various versions of what was happening, but none of them appeared to be based upon more than intelligent conjecture. From them it appears to be generally believed that the scheme of the manœuvres was based upon the advance of a hostile fleet from the direction of the Marshall Islands, to be met and engaged by the Japanese Fleet in the vicinity of the Bonin Islands. There was much activity with aircraft and submarines. In the last stage of the manœuvres, the Emperor himself went afloat in the Hiyei and acted as Chief Umpire. He afterwards reviewed the fleet of 161 ships and 180 aircraft in Tokio Bay.

H. G. THURSFIELD,  
Rear-Admiral.

## MERCHANT SHIPPING SECTION.



## CHAPTER VII.

### STANDING OF THE WORLD'S MERCHANT FLEETS.

THE outstanding feature revealed by a survey of the statistics covering the mercantile fleets of the world is the very definite shrinkage of the grand total at a considerably increasing rate since the decline set in three years ago.

During the year ended June, 1932, the reduction amounted to 396,730 gross tons. For 1933 it was 1,814,125 tons, and for 1934 it was no less than 2,343,573 tons. These figures are taken from the summaries provided by Lloyd's Register, and statistics published subsequent to June, 1934, indicate that the decline is continuing.

The restriction of shipbuilding output through the lack of opportunity to find profitable employment for even modern vessels has, for some years, caused the totals in many important countries to show no material advance—some have even receded. But the principal factor causing such a rapid shrinkage is the number of vessels which have recently been sold for breaking up. This has,

TABLE I.—NET ANNUAL INCREASE OR DECREASE IN WORLD TONNAGE.

	1934.	1933.	1932.	1931.
Sailing ships .	Gross Tons. — 73,841	Gross Tons. — 73,508	Gross Tons. — 42,070	Gross Tons. — 175,601
Steamships .	— 2,673,866	— 1,902,632	— 961,604	— 636,099
Motorships .	+ 404,134	+ 162,015	+ 606,944	+ 1,335,096
Net result .	—2,343,573	—1,814,125	—396,730	+ 523,396

naturally, affected primarily the older ships and partly accounts for the remarkable feature brought out in Table I that, during all this time, although steamships and sailing ships have decreased, motorships have advanced. Indeed, the decline of sail and steam tonnage has gone on for longer than the decreases in the grand total.

The decreases during last year affected all the maritime countries with the exception of Soviet Russia, Greece, and Finland. In each of these three instances the increase amounted to less than 100,000 tons. Table II shows the changes which have been going on during the last four years. The British decline started in 1931. The United States reached its peak in 1922, when it owned 14,738,506 tons of sea-going ships. To-day the American total is about 4,000,000 tons

TABLE II.—NET ANNUAL INCREASE OR DECREASE OF TONNAGE IN DIFFERENT COUNTRIES.

	1934.	1933.	1932.	1931.
	Gross Tons.	Gross Tons.	Gross Tons.	Gross Tons.
Great Britain and Ireland	-965,827	-970,936	-631,230	-135,539
Germany . .	-210,284	-263,568	-89,759	+ 25,366
Italy . .	-221,411	-240,765	+ 54,899	+ 4,447
Holland . .	-147,441	-198,383	-154,330	+ 31,855
U.S.A. . .	-312,762	-188,821	-95,563	-403,625
Japan . .	-185,452	+ 3,145	-21,327	- 40,463
Soviet Russia.	+ 99,047	+ 158,068	+ 81,308	+ 71,740
Panama . .	- 15,553	+ 148,621	+ 7,141	+ 55,903
Finland . .	+ 48,644	+ 88,407	+ 20,288	- 1,048
Norway . .	- 98,186	- 87,299	+ 101,333	+ 397,217
Greece . .	+ 90,189	- 52,993	+ 72,282	+ 6,883
France . .	-214,166	- 44,787	- 9,221	+ 35,348

less. The various details are embodied in Tables III and IV. They show that sailing ship tonnage accounts for less than 2 per cent. of the mercantile marine, whereas in 1914 sailing ships accounted for rather more than 8 per cent. Excluding, however, barges and various craft included in this category simply because they are not self-propelled, the world tonnage of real sailing vessels is estimated by Lloyd's Register to be only 506,000 tons, of which 158,000 tons (31 per cent.) are owned in the United States, 67,000 tons in Finland, 53,000 tons in Italy, and only 18,000 tons in Great Britain and Ireland. There are now in existence eleven sailing vessels of between

TABLE III.—TONNAGE OF THE WORLD.

Year.	Steam and Motor.		Sail.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.
1913	23,897	43,079,177	6,694	3,890,936	30,591	46,970,113
1914	24,444	45,403,877	6,392	3,655,075	30,836	49,089,552
1915	24,608	45,729,208	6,212	3,632,561	30,720	49,261,769
1916	24,132	45,247,724	6,035	3,435,412	30,167	48,683,136
1919	24,386	47,897,407	4,869	3,021,866	29,255	50,919,273
1920	26,513	53,904,688	5,082	3,409,377	31,595	57,314,065
1921	28,433	58,846,325	4,773	3,128,328	33,206	61,974,653
1922	29,255	61,342,952	4,680	3,027,834	33,935	64,370,786
1923	29,246	62,335,373	4,261	2,830,865	33,507	65,166,238
1924	29,024	61,514,140	3,932	2,509,427	32,956	64,023,587
1925	29,205	62,380,376	3,711	2,261,042	32,916	64,641,418
1926	29,092	62,671,937	3,523	2,112,433	32,615	64,784,370
1927	28,967	63,267,302	3,205	1,925,608	32,175	65,192,910
1928	29,387	65,159,413	3,021	1,795,246	32,405	66,954,659
1929	29,612	66,407,393	2,870	1,666,919	32,482	68,074,312
1930	29,996	68,023,804	2,717	1,583,840	32,713	69,607,644
1931	29,952	68,722,801	2,392	1,408,239	32,344	70,131,040
1932	29,932	68,368,141	2,315	1,366,169	32,247	69,734,310
1933	29,515	66,627,524	2,185	1,292,661	31,700	67,920,185
1934	28,964	64,357,792	2,033	1,218,820	30,997	65,576,612

Owing to the War, statistics were not compiled regarding the vessels recorded in Lloyd's Register Books for the years 1917 and 1918. Tonnage figures for sailing vessels prior to 1919 are net tons; otherwise all tonnages are gross tons.

TABLE IV.—TONNAGE OWNED BY PRINCIPAL MARITIME COUNTRIES.  
(In thousands of tons, '000 omitted.)

Year.	Great Britain and Ireland.	United States (Sea-going).	Japan.	Germany.	Italy.	France.
1914	19,257	2,970	1,708	5,459	1,668	2,319
..	16,555	10,782	2,325	3,503	1,370	2,234
1920	18,330	13,790	2,996	673	2,242	3,245
1921	19,571	14,697	3,355	717	2,651	3,652
1922	19,296	14,738	3,587	1,887	2,866	3,846
1923	19,281	14,597	3,604	2,590	3,034	3,737
1924	19,106	13,530	3,843	2,954	2,832	3,498
1925	19,441	12,949	3,920	3,074	3,029	3,512
1926	19,400	12,365	3,968	3,111	3,241	3,490
1927	19,309	12,070	4,033	3,363	3,483	3,470
1928	19,875	11,997	4,140	3,777	3,429	3,344
1929	20,166	11,835	4,187	4,093	3,285	3,379
1930	20,438	11,388	4,317	4,229	3,331	3,531
1931	20,303	10,999	4,276	4,255	3,336	3,568
1932	19,672	10,889	4,255	4,165	3,391	3,557
1933	18,701	10,693	4,258	3,901	3,150	3,512
1934	17,735	10,355	4,073	3,691	2,928	3,298

Year.	Norway.	Holland.	Sweden.	Spain.	Denmark.	Total all Nations.
1914	2,505	1,496	1,118	899	820	49,089
..	1,858	1,592	993	751	702	50,919
1920	2,219	1,793	1,073	997	803	57,314
1921	2,584	2,226	1,160	1,165	964	61,975
1922	2,601	2,633	1,115	1,283	1,038	64,371
1923	2,552	2,626	1,208	1,260	997	65,166
1924	2,505	2,556	1,254	1,240	1,036	64,024
1925	2,680	2,601	1,301	1,185	1,060	64,641
1926	2,842	2,565	1,338	1,163	1,081	64,784
1927	2,824	2,654	1,365	1,162	1,060	65,193
1928	2,968	2,817	1,447	1,164	1,068	66,955
1929	3,324	2,939	1,510	1,162	1,058	68,074
1930	3,668	3,086	1,624	1,232	1,088	69,608
1931	4,066	3,118	1,705	1,227	1,145	70,131
1932	4,167	2,964	1,716	1,265	1,181	69,734
1933	4,080	2,765	1,675	1,232	1,168	67,920
1934	3,981	2,618	1,609	1,178	1,104	65,577

3,000 and 3,400 tons gross, but no longer are there any large full-rigged ships on the British Register. For all practical purposes, therefore, sailing ships can be ignored in the statistical comparisons.

A survey of the changes which have taken place in steam and motor tonnage, given in detail in Table V, shows that, during the ten years June, 1914, to June, 1924, the net increase was rather more than 16,000,000 tons, or 35.5 per cent. on the 1914 figure, notwithstanding the heavy war losses of something like 11,000,000 tons. With no such process of attrition in operation subsequently, the change from 1924 to last year represents a net increase of under 3,000,000 tons, or less than 5 per cent. This slowing down reflects, on the one hand, the misplaced optimism regarding the commercial

TABLE V.—COMPARISON OF STEAM AND MOTOR TONNAGE AT JUNE, 1914; JUNE, 1924; AND JUNE, 1934.

Countries.	1914.	1924.	1934.	Difference between	
				1924 and 1914.	1934 and 1924.
Great Britain and Ireland . .	Gross Tons. 18,892,000	Gross Tons. 18,954,000	Gross Tons. 17,630,000	+ 62,000	- 1,324,000
British Dominions . .	1,632,000	2,592,000	2,978,000	+ 960,000	+ 386,000
Denmark . .	770,000	990,000	1,101,000	+ 220,000	+ 111,000
France . .	1,922,000	3,290,000	3,260,000	+ 1,368,000	- 30,000
Germany . .	5,135,000	2,872,000	3,680,000	- 2,263,000	+ 808,000
Greece . .	821,000	757,000	1,507,000	- 64,000	+ 750,000
Holland . .	1,472,000	2,542,000	2,612,000	+ 1,070,000	+ 70,000
Italy . .	1,430,000	2,719,000	2,875,000	+ 1,289,000	+ 156,000
Japan . .	1,708,000	3,843,000	4,073,000	+ 2,135,000	+ 230,000
Norway . .	1,957,000	2,392,000	3,980,000	+ 435,000	+ 1,588,000
Spain . .	884,000	1,188,000	1,164,000	+ 304,000	- 24,000
Sweden . .	1,015,000	1,191,000	1,597,000	+ 176,000	+ 406,000
United States (Sea) . .	2,027,000	12,431,000	9,795,000	+ 10,404,000	- 2,636,000
" (Lakes) . .	2,260,000	2,276,000	2,508,000	+ 16,000	+ 232,000
Other Countries. .	3,479,000	3,477,000	5,598,000	- 2,000	+ 2,121,000
Totals . .	45,404,000	61,514,000	64,358,000	+ 16,110,000	+ 2,844,000

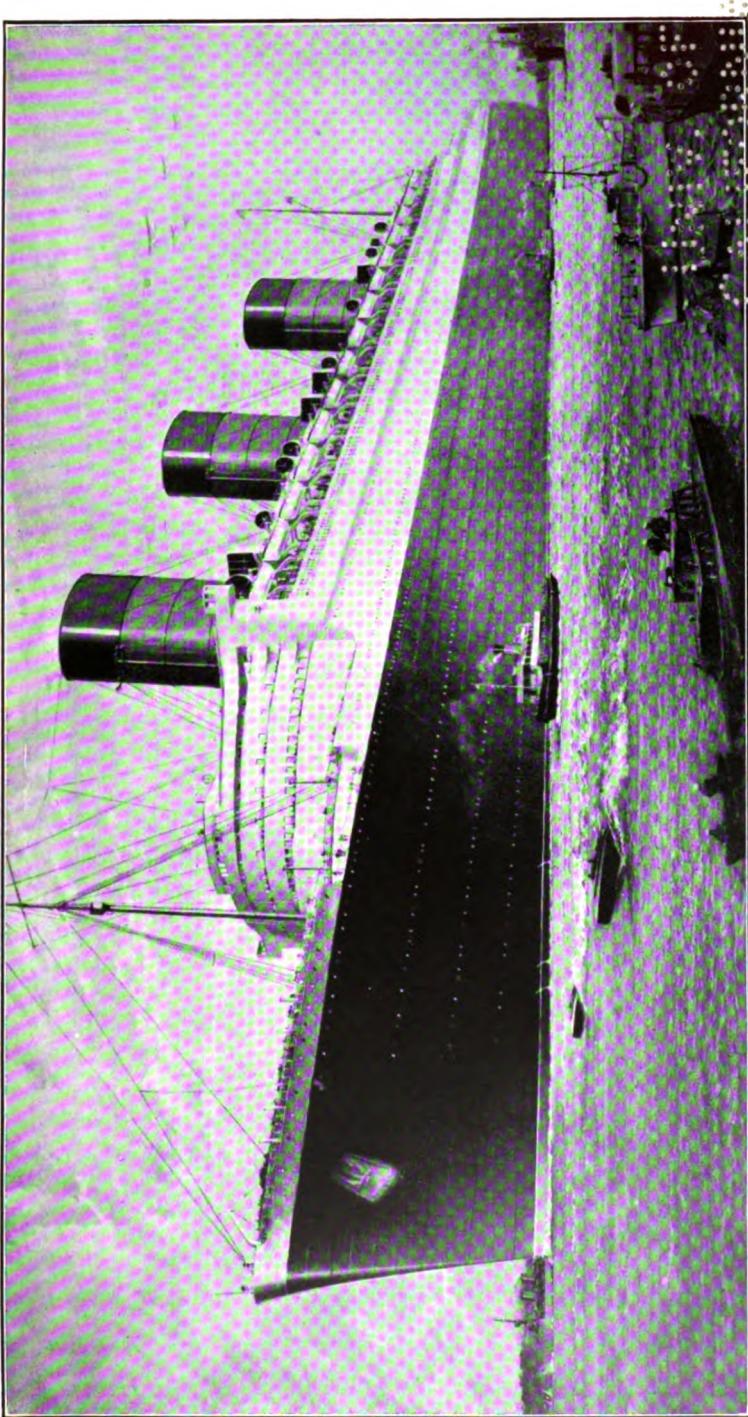
possibilities of the immediate post-War era and, on the other, the curtailment of international trading and restricted overseas carrying.

The nations which progressed most during the first decade under review were the United States (10,420,000 tons), Japan (2,185,000 tons), France (1,368,000 tons), Italy (1,289,000 tons), and Holland (1,070,000 tons). In the second decade advances were made, notably by Norway (1,588,000 tons), because of the large increase in her oil tanker fleet, to which reference will be made later ; Germany (808,000 tons), which, however, is still 1,455,000 tons below the pre-War figure ; Greece (750,000 tons), principally through the purchase of second-hand tonnage and not shipbuilding activity ; and Sweden (406,000 tons), the Swedes having considerably expanded their international trade during this period, especially by the carriage of fruit and, to a smaller extent, oil.

To-day the British total is actually 6·7 per cent. less than it was in 1914, although the tonnage owned by the other countries has, in the same time, increased by 76 per cent. The changes are even more striking when figures covering the present century are considered. These are given in Table VI and show how the British

TABLE VI.—PERCENTAGE OF TONNAGE OWNED COMPARED WITH 1901 AND 1914.

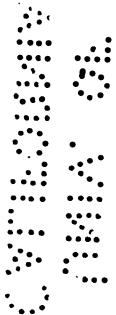
	1901. per cent.	1914. per cent.	1926. per cent.	1932. per cent.	1933. per cent.	1934. per cent.
Great Britain and Ireland . .	50·2	41·6	30·7	28·6	27·9	27·4
United States (Sea) . .	4·2	4·5	18·1	15·0	15·1	15·2
Japan . .	2·2	3·8	6·3	6·2	6·4	6·3
Norway . .	3·4	4·3	4·5	6·1	6·1	6·2
Germany . .	10·1	11·3	4·9	6·1	5·8	5·7
France . .	4·4	4·2	5·3	5·1	5·2	5·1
Italy . .	2·7	3·1	5·0	4·9	4·6	4·5
Holland . .	2·1	3·2	4·1	4·3	4·1	4·1



THE CUNARD WHITE STAR TURBINE LINER QUEEN MARY.

[FROM A PICTURE.]

(*Builders, Messrs. John Brown and Co., Clydebank.*)



proportion has declined from 50·2 to 27·4 per cent. This country is the only one which shows any proportional drop during this period, owning something like 1,000,000 tons less than it did in 1914.

An examination of the figures in Lloyd's Register showing the age of vessels reveals some interesting differences concerning the respective holdings of various countries. Rather more than 10 per cent. of the steam and motor tonnage is less than 5 years old, while at the other end of the scale 17 per cent. is more than 25 years old. The greatest tonnage is of vessels between 10 and 15 years old, and totals 16,250,000 tons, or about 25 per cent. These ships, of which the details for various countries are shown in Table VII, are those which were built from just after the War ended up to about 1924. These 5,128 vessels are a subject of interesting speculation, because, although apparently young, they represent a type of construction which, in many cases, would entitle them to be classed as older ships. Many are the products of shipyards which sprang into being about the end of the War but have no longer any existence to-day. Some are of doubtful workmanship, lacking the refinements of economical machinery details which were introduced into the later ships. They had to be constructed of such material as was then available, and some of it was of doubtful quality.

TABLE VII.—STEAM AND MOTOR SHIPS WITHIN THE 10–15 YEAR RANGE COMPARED WITH THE TOTAL OWNED IN EACH COUNTRY.

	10–15 years old.		Total Owned.	
	No.	Gross Tons.	No.	Gross Tons.
Great Britain and Ireland . . . . .	1,252	4,896,344	7,107	17,629,548
U.S.A. (Sea) . . . . .	667	3,423,292	2,560	9,795,126
Denmark . . . . .	192	321,129	686	1,100,778
France . . . . .	336	1,117,408	1,459	3,259,594
Germany . . . . .	574	1,542,867	2,032	3,680,353
Greece . . . . .	26	103,602	550	1,507,260
Holland . . . . .	230	821,026	1,407	2,612,377
Italy . . . . .	194	718,878	1,031	2,857,183
Japan . . . . .	361	884,700	1,949	4,072,707
Norway . . . . .	307	688,251	1,904	3,980,101
Spain . . . . .	129	310,450	782	1,164,489
Sweden . . . . .	165	302,164	1,309	1,597,314
Total for these and other countries . . . . .	5,128	16,252,971	28,964	64,357,792

It is important to bear these points in mind when assessing the age of ships in relation to their actual trading value, because when they are considered in relation to the laid-up tonnage statistics, it will be found that these are the ships for which it has been most difficult to find profitable employment. According to figures published by the Chamber of Shipping at the beginning of last year, ships in this range represented no less than 37 per cent. of the total tonnage of ships laid up in Great Britain and Ireland, and 39 per

cent. of ships laid up at the beginning of July last. An analysis as at the latter date is given in Tables VIII and IX. Some of the ships are also largely figuring in the sales for breaking-up purposes.

TABLE VIII.—BRITISH STEAM AND MOTOR SHIPS LAID UP IN PORTS OF GREAT BRITAIN AND IRELAND IN JULY, 1934, IN DIVISIONS OF AGE.

	No.	Gross Tons.	Laid up as Percentage of Tonnage on Register.	Laid up as Percentage of Total Tonnage laid up.
Under 5 years . . . .	16	85,600	4·6	5·0
5-10 years . . . .	59	257,400	5·6	15·0
10-15 " . . . .	134	676,700	14·4	39·4
15-20 " . . . .	66	343,300	11·6	20·0
20-25 " . . . .	68	224,600	10·2	13·1
25 years upwards . . . .	55	130,000	10·2	7·6
Total . . . .	398	1,717,600	9·7	100·0

TABLE IX.—BRITISH STEAM AND MOTOR SHIPS LAID UP IN PORTS OF GREAT BRITAIN AND IRELAND IN JULY, 1934, SHOWING PROPORTION OF 10-15 YEAR OLD SHIPS TO TOTAL LAID UP, ARRANGED ACCORDING TO SIZE OF VESSELS.

	10-15 years.		Total.		Total Laid up as Percentage of Tonnage on Register.	Laid up as Percentage of Total Tonnage Laid up.
	No.	Gross Tons.	No.	Gross Tons.		
100-500 tons .	4	1,200	41	13,300	1·7	0·8
500-1,000 "	5	3,800	29	22,300	4·8	1·3
1,000-2,000 "	6	9,800	56	79,000	8·7	4·6
2,000-4,000 "	4	13,100	57	176,700	10·1	10·3
4,000-6,000 "	31	153,400	122	609,300	11·4	35·5
6,000-8,000 "	5	32,300	56	380,500	10·8	22·2
8,000-10,000 "	7	60,400	21	183,080	11·7	10·7
10,000-15,000 "	1	10,900	9	112,500	7·3	6·5
15,000-20,000 "	2	31,300	4	66,900	7·7	3·9
20,000 tons and over	1	27,100	3	73,300	8·3	4·3
Total . . . .	66	343,300	398	1,717,600	9·7	100·0

In many instances other ships of similar age have been able to face up to the economic storm only by the introduction of various "rejuvenating" devices which have been evolved in the fertile minds of inventive engineers. The number of ships which can thus be rendered more economical units is limited, as also are the trading opportunities which will make the additional expense worth incurring. Considerable changes have, however, been made, particularly in ships between the 10-15 year range. In some cases the original machinery has been taken entirely out; some of it was constructed by unskilled hands in works of immature experience. In certain cases the original steam engines have been removed and new steam

generators installed. The water-tube boiler, which twenty years ago was looked upon with disfavour by those responsible for operating merchant ships, has made considerable strides, especially since the development of oil-firing removed one of the principal difficulties—the maintenance of adequate stoking by manual labour in coal-fired boilers. The introduction of the exhaust steam turbine for increasing the efficiency of existing steam reciprocating units was followed by certain electric devices with a similar objective and later by exhaust steam compressors, as installed for example in the Hartlebury and Harpasa. Some steam installations have been replaced by Diesel engines and in a few instances motorships have been converted to steamships.

Engineers have certainly risen to the occasion, and one of their most interesting achievements has been in the case of the Royal Mail liners Asturias and Alcantara to design single-reduction geared steam turbines which, in conjunction with Johnson water-tube boilers, generate a greater power than the original Diesel engines without demanding more space than the original engine-room provided. The object was to convert the ships into faster units and bring them into line with vessels which foreign competing companies had placed in service after they were originally commissioned.

These various changes are cited to show how misleading it is to judge vessels by the criterion of age alone, especially ships built ten or fifteen years ago. On the one hand, they may be much older than their years, while on the other, they may have been given a new lease of life. But, as already suggested, there is little doubt that, on a broad survey, most are for practical purposes considerably older than the owner of mature years and experience would at one time have regarded vessels of ten to fifteen years in age.

An estimate made annually by Lloyd's Register of the tonnage of the world available for general cargo and passenger purposes excludes oil tankers, fishing vessels, tugs and salvage craft, ferries and river craft, and thus excludes for the year under review about 11,148,000 tons. Carrying the pruning process farther so as to eliminate vessels trading on the Great Lakes, wooden and composite ships, ships less than 4,000 gross tons, and practically all over twenty-five years old, the total steam and motor tonnage is reduced by nearly 34,000,000 tons. The changes thus effected are shown in Table X. This table also indicates the high efficiency of the British mercantile marine, which, incidentally, also possesses 50 per cent. of liner tonnage of 15,000 tons upwards, and 228 of the 472 ships which are of 10,000 tons and above.

Another computation, which has been a feature of "Brassey" for many years, is based on a different principle, and is shown in Table XI. While not confined to the larger ocean-going ships it shows in detail a number of features omitted from the preceding table.

The spate of oil-tanker production which started about four years ago declined until, by the end of 1933, there were only 19 oil tankers of 117,608 tons building throughout the world, as against the record number of 148 of 1,110,000 tons building at the middle of 1930. The ownership of tankers reached its peak in 1932, when

TABLE X.—OCEAN-GOING TONNAGE.

Countries.	Total Steam and Motor Tonnage.		Ocean-going Tonnage.	
	Tonnage Owned.	Percentage of World Total.	Tonnage Owned.	Percentage of World Total.
Great Britain and Ireland . . . . .	17,629,548	27.39	11,255,936	36.72
United States . . . . .	12,381,919	19.24	5,421,168	17.69
Germany . . . . .	3,680,353	5.72	2,215,195	7.23
Japan . . . . .	4,072,707	6.33	2,093,573	6.83
France . . . . .	3,259,594	5.06	1,850,332	6.04
Italy . . . . .	2,875,183	4.47	1,712,065	5.59
Holland . . . . .	2,612,377	4.06	1,550,947	5.06
Norway . . . . .	3,980,101	6.18	1,005,286	3.28
Other Countries . . . . .	13,866,010	21.55	3,548,513	11.56
World Totals . . . . .	64,357,792	100.00	30,653,015	100.00

TABLE XI.—TONNAGE AVAILABLE FOR CARRYING GOODS AND PASSENGERS.

	Gross Tons.	Gross Tons.
Total Tonnage of the World . . . . .	—	65,576,612
Sailing Ships . . . . .	1,218,820	
Oil Tankers, 1,000 tons and over . . . . .	8,668,477	
Oil Tankers, under 1,000 tons . . . . .	107,532	
Trawlers and other Fishing Vessels . . . . .	1,053,089	
Tugs and Salvage Vessels . . . . .	396,277	
Ferries, dredgers, cable-ships, river-craft, etc.	917,883	
Lake vessels, U.S.A. . . . .	2,507,770	
Lake vessels, Canada . . . . .	423,227	
		15,293,075
Steam and Motor Tonnage available for goods and passengers . . . . .	50,283,537	
Comparative figure for 1933 . . . . .	52,492,397	
" " " 1932 . . . . .	53,815,821	
" " " 1931 . . . . .	54,597,403	
" " " 1930 . . . . .	55,067,368	
" " " 1929 . . . . .	54,080,656	
" " " 1928 . . . . .	53,332,592	
" " " 1927 . . . . .	52,182,481	

the total tanker tonnage was 8,911,000 tons, representing, as is shown in Table XII, 18 per cent. of the total world tonnage as against only 3 per cent. twenty years ago. Since then the figure has dropped somewhat, roughly in the same proportion as the general decline of the merchant fleets. Tankers no longer accounted for quite so much of the work in the shipyards, for, as shown in Table XIII, at the beginning of 1934 only 16 per cent. of the shipbuilding construction consisted of tankers compared with 39 per cent. in 1931. There was, however, a considerable proportional increase towards the end of the year, the tankers in October accounting for 25 per cent. of the tonnage building in the world. The Norwegian tanker fleet, which from 1926 to 1932 grew from 344,000 tons to 1,539,000 tons, showed a slight decline, the details being given in Table XIV.

This growth of the oil tanker fleet has been an important factor in stimulating the development of the motorship, which, as already

## STANDING OF THE WORLD'S MERCHANT FLEETS. 105

 TABLE XII.—PERCENTAGE OF TANKERS TO TOTAL WORLD TONNAGE  
 (SAIL EXCLUDED).

	Total World Tonnage (Sail excluded).	Tankers.	Percentage Tankers.
1914 . . . . .	Gross Tons. 45,404,000	Gross Tons. 1,479,000	3
1919 . . . . .	47,897,000	2,929,000	6
1920 . . . . .	53,905,000	3,354,000	6
1921 . . . . .	58,846,000	4,419,000	8
1926 . . . . .	62,672,000	5,665,000	9
1928 . . . . .	65,159,000	6,620,000	10
1929 . . . . .	66,407,000	7,074,000	11
1930 . . . . .	68,024,000	7,628,000	11
1931 . . . . .	68,723,000	8,650,000	13
1932 . . . . .	68,368,000	8,911,000	13
1933 . . . . .	66,627,000	8,757,000	13
1934 . . . . .	64,358,000	8,668,000	13

 TABLE XIII.—PROPORTION OF SHIPBUILDING CONSTRUCTION ABSORBED BY  
 OIL TANKERS.

	Oil Tankers.	Total Shipbuilding.	Percentage Tankers.
Jan. 1, 1922 . . . . .	793,193	4,457,393	18
" 1923 . . . . .	300,128	2,964,318	10
" 1924 . . . . .	175,164	2,444,336	7
" 1925 . . . . .	300,270	2,470,436	12
" 1926 . . . . .	308,439	2,069,545	15
" 1927 . . . . .	371,520	1,933,027	19
" 1928 . . . . .	744,668	3,118,721	24
" 1929 . . . . .	361,972	2,618,001	14
" 1930 . . . . .	627,756	3,110,880	20
" 1931 . . . . .	907,298	2,326,086	39
" 1932 . . . . .	351,320	1,403,795	25
" 1933 . . . . .	194,490	765,720	25
" 1934 . . . . .	117,608	757,277	16
Oct. 1, 1934 . . . . .	324,712	1,311,387	25

 TABLE XIV.—PROPORTION OF TANKERS IN THE NORWEGIAN MERCANTILE  
 MARINE.

Year.	Tankers.		Total Norwegian Fleet.		Percentage Tanker Tonnage.
	No.	Gross Tons.	No.	Gross Tons.	
1934	213	1,506,887	1,908	3,981,354	38
1933	214	1,508,033	1,970	4,079,540	37
1932	217	1,530,384	2,008	4,166,839	37
1931	204	1,450,470	1,990	4,065,506	36
1930	154	1,059,550	1,916	3,668,289	29
1929	117	781,575	1,807	3,224,493	24
1928	88	564,210	1,787	2,968,207	19
1927	63	403,812	1,805	2,824,225	14
1926	54	343,582	1,844	2,841,905	12

mentioned, is the only type of propulsion—sail, steam, and motorship—which has not declined. Even here, as will be seen from Table XV, the rate of progress has been reduced; but the fact that there are something like 4,000 motorships of 10,000,000 tons more

in existence to-day than in 1919 is a remarkable indication of the strides which have been made in a form of propulsion which, as applied to merchant ships, was only in its infancy twenty years ago, and even in 1919 was represented by fewer than a thousand ships (including even auxiliary sailing ships) of about 752,000 tons.

TABLE XV.—NUMBER AND GROSS TONNAGE OF MOTORSHIPS.

Lloyd's Register Book.	Motorships (including Auxiliary Vessels).	
	No.	Gross Tons.
July, 1914 . . . . .	297	234,287
" 1919 . . . . .	912	752,606
" 1920 . . . . .	1,178	955,810
" 1921 . . . . .	1,472	1,248,800
" 1922 . . . . .	1,620	1,542,160
" 1923 . . . . .	1,795	1,666,385
" 1924 . . . . .	1,950	1,975,798
" 1925 . . . . .	2,145	2,714,073
" 1926 . . . . .	2,343	3,493,284
" 1927 . . . . .	2,552	4,270,324
" 1928 . . . . .	2,933	5,432,302
" 1929 . . . . .	3,246	6,628,102
" 1930 . . . . .	3,696	8,096,337
" 1931 . . . . .	4,080	9,431,433
" 1932 . . . . .	4,420	10,038,377
" 1933 . . . . .	4,663	10,200,392
" 1934 . . . . .	4,941	10,604,526

Certain countries abroad have very high proportions of their fleets propelled by heavy-oil engines; the percentage for Norway is 45·2, for Denmark 41·2, and for Sweden 34·5. It is interesting to compare these with the figure of 16·2 per cent., which is the ratio motor tonnage bears to the aggregate tonnage owned throughout the world, and also with the figure of 15·8 per cent., which is the proportion of motorship tonnage owned in the British merchant navy. Reduced, however, to actual tonnage figures, it will be observed from the abstracts from Lloyd's Register in Table XVI how much greater is the actual number and tonnage of motorships owned in Great Britain and Ireland than in the other countries.

TABLE XVI.—MOTORSHIPS COMPARED WITH TOTAL TONNAGE.

	Motorships owned.		Total Tonnage owned.	
	No.	Gross Tons.	No.	Gross Tons.
Great Britain and Ireland	632	2,716,683	7,469	17,734,912
Norway . . . . .	424	1,798,015	1,908	3,981,354
Denmark . . . . .	211	455,115	700	1,104,397
Sweden . . . . .	330	555,554	1,339	1,608,872

Moreover, there are several other countries which own more motorship tonnage than two of the three Scandinavian countries. They

are : America, with 729,482 tons ; Germany, with 671,470 tons ; Holland, with 781,090 tons ; Italy, with 622,158 tons ; and Japan, with 707,575 tons. Of the big maritime nations the smallest proportions of motorship tonnage are owned in America (5·6 per cent.) and France (7·6 per cent.) although, since Greece figures so much in shipping references nowadays, it may be interesting to record that of the 550 ships of 1,507,260 tons owned in that country only 13 of 5,542 tons are motorships. The probable explanation is that Greece recruits her merchant ships largely from the second-hand market, that two-thirds of her fleet is more than twenty years old, and that it is not the motorship which has been figuring so largely in the activities of the second-hand market.

The number of ships with steam reciprocating engines continues to decline materially, and side by side with the general reduction of steam tonnage the steam turbine has also lost ground. Table XVII, giving abstracts from Lloyd's Register annual report, published last autumn, shows the changes.

TABLE XVII.—TYPES OF MACHINERY.

Year.	Type of Steam Engines.		Motorships.
	Reciprocating	Turbines.	
1931 . . . . .	Gross Tons. 50,225,758	Gross Tons. 9,065,610	Gross Tons. 9,431,433
1932 . . . . .	49,098,475	9,231,289	10,038,377
1933 . . . . .	47,206,393	9,220,739	10,200,392
1934 . . . . .	44,728,790	9,024,476	10,604,526

Turbo-electric ships are included in the steam turbine category and Diesel-electric in motorships. Further details of these electrically driven ships appear in Table XVIII, and an analysis of ships with

TABLE XVIII.—ELECTRIC DRIVE.

Year.	Turbo-electric.		Diesel-electric.	
	No.	Tons.	No.	Tons.
1934 . . . . .	42	444,548	53	118,853
1933 . . . . .	43	448,434	48	117,184
1932 . . . . .	42	388,962	48	116,684
1931 . . . . .	38	342,400	46	114,690
1930 . . . . .	30	218,688	37	89,593

steam reciprocating engines and a combination of reciprocating and turbine engines is given in Table XIX. Certain aspects of the introduction of the combination system were discussed when reference was made to features connected with the age of ships.

No great change has taken place in the last few years in the employment of fuel such as was witnessed, just after the War, in the development of oil-fuel burning for steamships and the expansion of the motorship fleets. Such changes as have occurred are shown in

TABLE XIX.—PROPORTIONS OF COMBINATION SYSTEM.

Year.	Reciprocating Engines.		Combination System.	
	No.	Tons.	No.	Tons.
1934 . . . . .	22,425	42,831,945	263	1,868,071
1933 . . . . .	23,485	47,177,395	234	1,801,739
1932 . . . . .	24,138	49,068,098	228	1,770,111
1931 . . . . .	24,489	50,194,250	199	1,570,124
1930 . . . . .	24,878	50,748,180	150	1,265,929
1929 . . . . .	24,892	50,540,617	93	839,082
1928 . . . . .	24,922	50,010,702	58	662,951

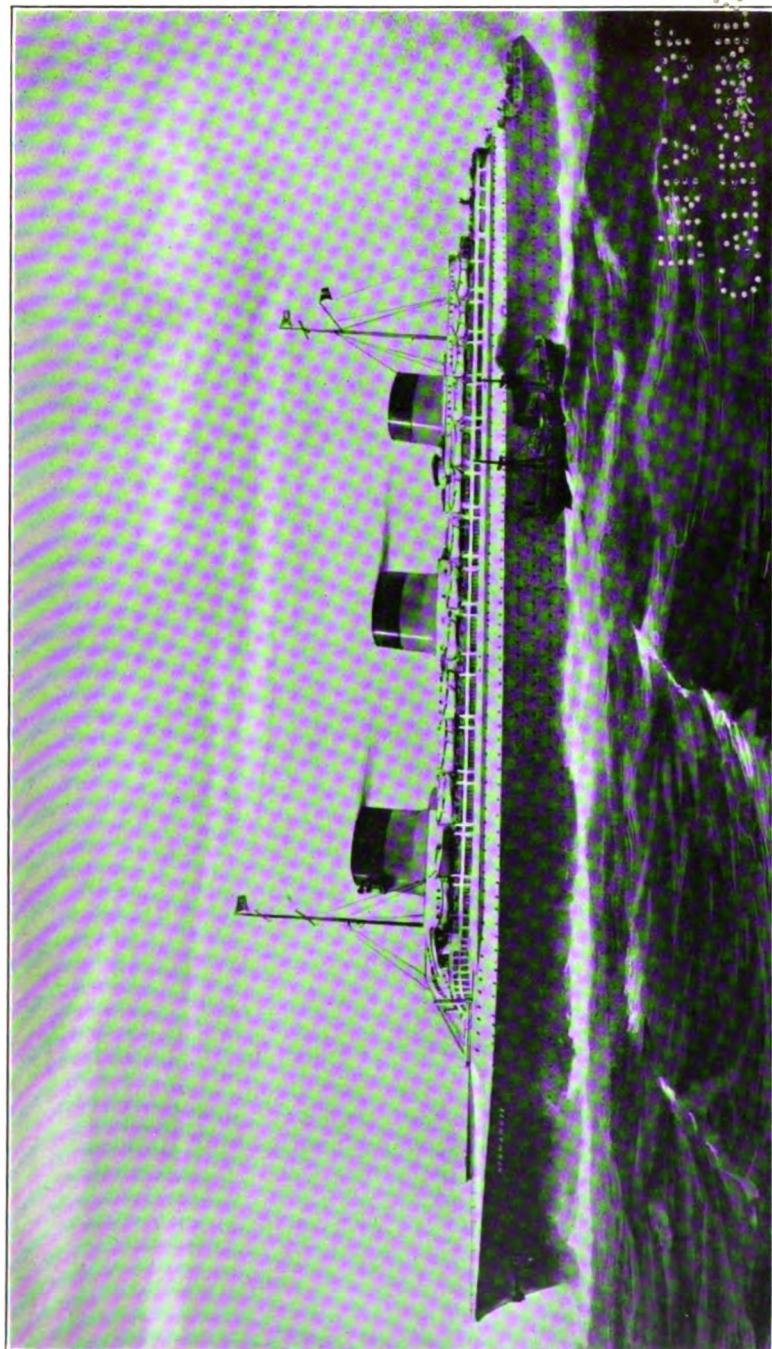
Table XX; they continue to be at the expense of coal, which, to-day, is exclusively used in only 52 per cent. of the merchant fleet compared with 89 per cent. twenty years ago and 71 per cent. twelve years ago.

TABLE XX.—PERCENTAGE OF TONNAGE FITTED FOR EMPLOYING OIL OR COAL AND PERCENTAGE OF SAILING SHIPS TO THE GRAND TOTAL.

	Percentage of Total Gross Tonnage.						
	1914.	1922.	1930.	1931.	1932.	1933.	1934.
Sailing vessels and sea-going barges . . . . .	8·06	4·70	2·27	2·01	1·96	1·90	1·86
Oil, etc., in internal-combustion engines . . . . .	0·45	2·35	11·63	13·45	14·40	15·02	16·17
Oil fuel for boilers . . . . .	2·65	22·34	28·53	28·52	28·87	29·52	30·28
Coal . . . . .	88·84	70·61	57·57	56·02	54·77	53·56	51·69
	100·00	100·00	100·00	100·00	100·00	100·00	100·00

At the outset of this article the influence of the breaking up of ships in reducing the aggregate tonnage of the world's merchant fleet was mentioned. Reductions are achieved by three methods. There is the temporary one of laying up ships which, notwithstanding many efforts at concerted action, is left to the haphazard expedient of economic duress, the painful results of which become more and more apparent as the years pass. The other two—the one voluntary up to a certain point, and the other involuntary in these more enlightened days—are selling for breaking up and marine casualties. So far as the latter is concerned the stringency of legislation and the remarkable efficiency of the classification societies, in both their regulations and their surveys, have contributed, in conjunction with the introduction of many safety devices for navigation, to reduce the yearly percentage of losses very materially. For example, the average yearly percentage of steam and motor tonnage lost during the last five years is only 0·58 per cent., whereas during the five years immediately preceding the War it was 1·17 per cent. It has been suggested that a contributory factor has been the exceptionally large number of ships lately out of commission.

It is plain, however, that this process of attrition cannot hold the mercantile marine down to reasonable limits. Consequently, one must look to selling for scrap. Here the figures quoted by Lloyd's Register show very remarkable variations. During the period 1905–14 the yearly minimum was 87,737 tons and the



THE CIE. GÉNÉRALE TRANSATLANTIQUE'S TURBO-ELECTRIC LINER NORMANDIE.

[FROM A PICTURE.]

(*Builders, Forges et Chantiers de Saint Nazaire, Peuhogat.*)

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maximum 251,900 tons. During the War years practically no tonnage was broken up ; indeed, extraordinary salvage feats were achieved for the sake of getting a ship floatable for a few years, as is not strange when the price of ships soared to fancy figures exceeding £60 per ton. War losses, of course, were considerable, as will be seen from reference to Table XXI. The yearly average, at that

TABLE XXI.—TONNAGE LOST AND BROKEN UP.

Year.	Steamers and Motorships.		Sailing Ships.	
	No.	Tons (gross).	No.	Tons (net).
1916 . . . .	1,288	2,724,041	511	284,224
1917 . . . .	2,605	6,607,261	748	520,206
1918 . . . .	1,294	3,332,791	325	159,919
1919 . . . .	425	524,172	241	112,658 (gross)
1920 . . . .	370	518,595	215	138,959
1921 . . . .	344	536,537	215	137,720
1922 . . . .	511	743,866	205	143,946
1923 . . . .	709	1,456,870	259	259,909
1924 . . . .	777	1,614,662	239	243,017
1925 . . . .	553	980,794	186	161,241
1926 . . . .	656	1,226,873	182	117,070
1927 . . . .	469	852,398	154	139,671
1928 . . . .	584	1,220,176	121	94,471
1929 . . . .	672	1,458,665	120	84,937
1930 . . . .	561	1,232,521	107	80,763
1931 . . . .	558	1,335,708	64	33,112
1932 . . . .	573	1,696,245	78	55,112
1933 . . . .	930	2,733,458	99	57,702

## WAR LOSSES INCLUDED IN THE ABOVE TABLE.

Year.	Steamers and Motorships.		Sailing Ships.	
	No.	Tons (gross).	No.	Tons (net).
1916 . . . .	942	2,180,079	245	139,609
1917 . . . .	2,211	5,957,913	523	392,449
1918 . . . .	911	2,674,428	141	69,744

period, of ships broken up was only about 10,000 tons. For 1921 the figure was 77,500 tons, for 1922 it was 315,000 tons, and for 1923 it was 963,000 tons, and except in 1927, when 402,698 tons were removed from the register for breaking up, the figure has kept at a high level. The million mark was exceeded three times—in 1924, 1931, and 1932—and in 1933 (the last full year for which figures are available) a new record was established by the passing of the two million mark. Details are given in Table XXII.

Countries with the highest figures for breaking up during the ten years are Great Britain and Ireland, with 2,888,000 tons ; United States, with 2,488,000 tons (sea-going vessels) ; Italy, with 1,317,000 tons ; France, with 697,000 tons ; and Germany, with 515,000 tons.

Yet, in spite of all these changes and the fact that the aggregate of steam and motor tonnage broken up during the ten years 1924-33 was 10,334,000 tons, and the losses by marine casualty were 4,015,000 tons, the annual average wastage of sea-going steam and motor tonnage only exceeded slightly 2 per cent. of the tonnage owned.

TABLE XXII.—STEAMERS AND MOTORSHIPS BROKEN UP.

	No.	Tons.
1921	34	77,545
1922	160	315,110
1923	385	962,506
1924	485	1,174,258
1925	273	653,046
1926	358	798,633
1927	189	402,698
1928	296	735,547
1929	352	943,609
1930	311	848,538
1931	324	1,018,174
1932	365	1,346,140
1933	686	2,413,189

The percentage of British-owned ships broken up compared with the total owned is relatively small, because so many older British ships are sold to other countries for trading purposes and not for scrap. This in turn reacts on the age of the vessels retained, so that the tonnage now owned in Great Britain and Ireland which is more than twenty years old is only 19·7 per cent., whereas for the tonnage owned abroad the proportion is as high as 31·4 per cent.

It will be seen, that although the tonnage of the world has decreased during the last two years, it is still very considerably greater than before the War. Statisticians state that the overseas trade is less, so that, notwithstanding the lapse of 20 years, there should be fewer ships than there were before the War. This argument would be more convincing if it were certain that world trade will not expand. If it does, then there may be a shortage of tonnage, because a great deal of that which is still borne on the Registers is old and inefficient. The dislocation of the freight market last summer showed how much nearer is the balance of shipping than it was, and a real trade revival would reveal this shortage in all its nakedness.

JOHN P. TAYLOR.

## CHAPTER VIII.

### THE GOVERNMENT AND BRITISH SHIPPING.

THE review of British shipping policy which appeared in the last issue of "Brassey" closed with the discussion in the House of Commons on December 18, 1933, when, replying to members who displayed keen interest in the whole matter, Mr. Walter Runciman, the President of the Board of Trade, suggested that it was for the shipping community, as a body, to find acceptable means which they could recommend to the Government with certainty and which would ensure that any financial aid given would not be dissipated or used for the advantage of those it was not intended to benefit.

The annual report of the Chamber of Shipping, published in February, contained many statements exhibiting the plight of the British shipping industry. Under the heading of "Tramps" the Chamber remarked that rates of freight were, on an average, 22½ per cent. below the average ruling before the War and that such rates implied a loss on practically every voyage with cargo, while scarcity of cargo increased the number of ballast tramp voyages. The loss of coal exports meant, compared with the experience before 1914, 700 fewer tramp ships with outward cargo each month. This loss of outward freight, it was declared, enormously increased the cost to the shipowner of his service in carrying homeward cargo, and homeward rates had not risen to repay the extra charge. Under the heading of "Liners" the Chamber wrote that trade restrictions, high manufacturing costs at home, and low costs of production, depreciated currencies and lack of purchasing power abroad had deprived these vessels of much of their outward cargo, and, although homeward cargoes had again been better than outward, the rates had been insufficient to make the round voyage profitable. The position of many passenger lines, already acute, became still graver.

As to the financial results, the Chamber stated that a large part of the industry was being starved and that the tramp section, representing about one-quarter of British shipping, had declared itself to be on the edge of bankruptcy. The published results of representative tramp companies showed that, with very few exceptions, deep-sea owners had made heavy losses on running expenses without providing any allowance for depreciation. Moreover, the reserves of this section were practically exhausted. The position of tramp owners in the coasting trade was also serious.

In such conditions owners generally were bound to continue their strenuous efforts to bring about some improvement. There was never any doubt that the most effective remedy would have been a great expansion of the volume of international commerce,

giving employment to much idle shipping ; but, unhappily, no sign of any such development appeared, and it was quite beyond the power of shipowners to bring about a recovery. They had done everything they could by providing all the transport that could be required and at rates which, very often, were quite unremunerative. Oversea commerce continued to be at a volume below that of 1913, while the tonnage available was very much larger. Some liner companies suffered especially heavily ; others were able to limit their losses by the working of the conference system and forms of rationalisation. Only the existence of reserves enabled many ownerships to carry on, since debit balances incurred on round voyages were serious. Tramp ownerships were often confronted with the alternative of accepting charters which they knew must result in adverse balances or of laying up their vessels or keeping them laid up. Frequently the consideration was whether the loss on a charter would be greater than the expense of laying up the ship.

#### A REPRESENTATIVE STATEMENT.

The invitation given by the Government to the shipping industry to agree on recommendations led to the preparation of a joint statement approved by the Chamber of Shipping of the United Kingdom and the Liverpool Steamship Owners' Association. As the latter had previously been exceptional as a local organisation in standing out for separate policies, the pronouncement was issued on behalf of the British shipping industry as a whole. This statement, the terms of which were communicated to the President of the Board of Trade, opened by declaring that the objects of proposals submitted were the restoration of prosperity to world trade, on which all shipping depended, and the encouragement of the abandonment of practices inimical to trade. It was then urged that the British Government should intensify with all possible dispatch its activity in the negotiation of new or revised treaties and trade agreements on certain lines. It was proposed that Great Britain, in consultation with the Dominions, should join with other nations in an effort to restore world trade, and that this group should include all the great creditor nations, should agree on the principles to be observed, and should concede most-favoured-nation terms only to each other. Among these principles should be an obligation on each creditor nation to accept such payment in goods and services as would offset its creditor position, and an obligation on all co-operating nations to stabilise prices and currencies and to restore the freedom of the seas for peaceful commerce. Bilateral agreements should first be negotiated, and should be framed, as far as possible, to lead naturally to the formation of a group of countries prepared to trade with one another on the agreed principles. The statement added that, in order to enable other creditor nations to take payment from their debtor and thereby restore the circle of world trade, every effort should be made to convince the world's chief creditors that they could not be paid either for debts or for exports of goods and

services unless they would accept payment in foreign goods and services.

These recommendations were especially noteworthy as showing the desire of the British shipping industry that everything practicable should be done to encourage the development of oversea commerce. Insistence on this essential need for shipping has been a main feature of the pronouncements made during recent years. It seemed as if leaders hoped against hope that such a revival of international commerce would develop as would save the situation for shipping without the adoption of legislative measures. It may be difficult for anyone not in close touch with the industry to appreciate how intense has been the feeling throughout all sections against making any application for assistance to the Government. This dislike of any such appeal has been consistent with the policy long pursued. British shipping leaders have watched other nations institute measures for the support—artificial as they considered it—of their mercantile marines, and they have thought that the principles which justified subsidies and other means of helping shipping were ill-conceived. They have cherished the belief that at some date not too distant the Governments would tire of pouring money into their shipping industries, or that the taxpayers would protest effectively against such squandering (as this expenditure was regarded) of their hard-earned resources. British shipowners have hoped that the nations generally would appreciate, after much experimenting, that their interests are best served by concentrating on the tasks for which their genius is best fitted and that their export trades would be best promoted by permitting other countries which were forced to live by the sea to render them services and thereby earn the means of providing part of the payment for their purchases of goods. Such considerations seemed to contain so much sound sense that British owners thought that they must prevail in the end. Meanwhile, they felt that, while nothing should be done, or said, that would appear critical of foreign policies, no action should be taken which was of the same type as that taken by other countries. Briefly, so the arguments ran, because other countries were acting foolishly there was no occasion for Britain to follow suit.

#### CAUSES PROMPTING ACTION.

This idea that British owners should not become "rattled," but should wait patiently and hope that things would right themselves in the long run, was no doubt admirable in theory, and, if British owners had possessed inexhaustible resources, which would have enabled them to wait until other people saw the error of their ways, it would, perhaps, have been fully justified. But realists perceived no indication that foreign countries would change their minds; nothing had then been heard of the discussion of wiser counsels in the United States which, lately, have given a small glimmering of hope that sounder views might prevail—and financial resources were being exhausted gradually or entirely. There are British owners who, partly because of the pursuit of prudent policies in

the past when earnings were conserved, have been, and are, buttressed against the attacks on their financial position made during the commercial war and also some owners who have been, and are, fortunate in being able to concentrate on particular trades, so that they have not been exposed to the full blasts of competition against which others are unprotected. Yet, because of the grave plight of most ownerships, the movement which urged that positive measures must supplant a negative attitude steadily gained force. There were plenty of reasons to prompt activity. The cutting of freight rates by more cheaply worked mercantile marines or by subsidised shipping, the growth of foreign mercantile marines at the expense of the British, and the increasing share of foreign mercantile marines in the trade of the United Kingdom were among the influences which tended towards a closer consolidation of views than has ever occurred before.

#### RECOMMENDATIONS TO THE GOVERNMENT.

Such a situation will explain the latter part of the recommendation made jointly by the Chamber of Shipping and the Liverpool Steamship Owners' Association, to which reference has just been made. After indicating how oversea commerce might be assisted to expand, these bodies suggested that the British Government, after consultation with the Dominions, should announce, first, that Imperial preferences would be enjoyed only by goods imported in ships belonging to countries which gave fair play to British exports and British shipping on the lines indicated, and secondly, that, pending the revival of trade and the effective operation of the measures described, subsidy would, where necessary, be met by subsidy. Accordingly, when any section of the British mercantile marine could show that a temporary subsidy was needed and would ensure its preservation for the time, the British Government should favourably consider the granting of such a subsidy, taking care not to prejudice other sections of British shipping thereby. This declaration, if studied carefully, will be seen to be remarkable, coming as it did authoritatively from the shipping industry as a whole. British shipowners have been twitted in past years in the House of Commons and elsewhere with inability to agree on a common policy. How, it had been suggested, could the Government be expected to act when the industry itself was not agreed on the course that should be taken?

By the joint declaration the two shipping associations went much farther in recommending action than they had previously done. The Liverpool Association had been especially antagonistic to the principle of subsidies and yet it was able to subscribe to a recommendation that, pending the revival of trade and the effective operation of other measures, subsidy should, where necessary, be met by subsidy. None of the advocates of a subsidy for any particular section has ever suggested that it should be other than temporary. All have recognised that the main objective should be to restore health to the industry, and shipping which was sub-

sidised could not be regarded as thoroughly robust. For many years the British shipping industry has contributed substantially to the invisible exports of the country. During recent years the contributions have been steadily declining quantities, but the idea that, instead of contributing to the revenue of the country, shipping should be a drag on its income was naturally repulsive to all. The advocates of temporary financial assistance have declared simply that the competition which British owners now have to meet is of such a heavily weighted character as often to be overwhelming, that financial assistance is essential in order to enable the industry to tide over a severe crisis, and that when, through a development of world commerce or the abandonment of unsound methods by foreign countries, or (and better still) the occurrence of both developments, the industry becomes again able to support itself, the case for Government assistance would no longer exist. Finally, the Chamber and the Liverpool Association urged that the Government should prune the various burdens of taxation and regulation imposed on British shipping in periods of prosperous trade.

These declarations represented a distinct advance in the consideration of the situation of the British shipping industry, and they prepared the way for other steps which were taken for coming to its rescue.

There followed a period of several months in which the grave state of the industry was emphasised by events, including the continued disposal of ships to foreign owners, particularly to Greek and Italian firms. Vessels were bought which, in British ownership, had long been lying idle, and employment was found for them at once under foreign flags where they could be worked more cheaply, with consequent intensification of competition for British owners. One development of the last two years which continued and had its encouraging aspect was the breaking-up of old shipping. This process was encouraged by the better prices ruling for scrap material, which reflected greater activity in the iron and steel trades, but it also signified that owners saw no point in incurring the considerable expense involved in undertaking the periodical surveys of some of the older ships and in reconditioning them for service. This disappearance of older tonnage was not without its prospect of benefit for the whole mercantile marine, and it was far preferable to the sales of ships to be maintained in service in competition with British tonnage.

#### GOVERNMENT PROPOSALS.

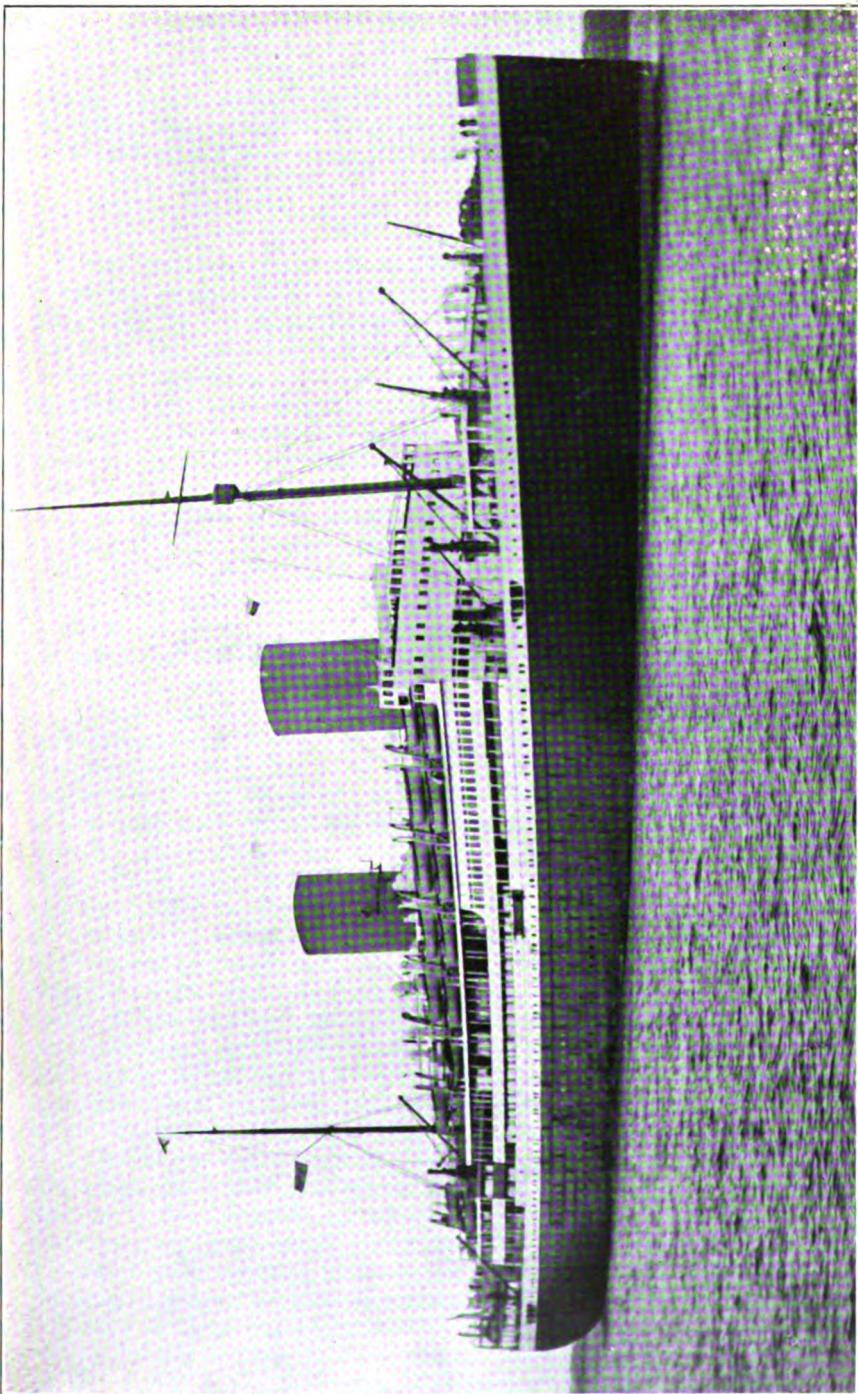
Members of Parliament continued to exhibit close concern for the welfare of the shipping industry, and the Government was repeatedly urged to indicate its policy. The President of the Board of Trade made it clear from time to time that the problems were receiving the careful consideration of the Government, and on July 3 he made a most important pronouncement in the House of Commons. Reviewing the situation, he stated that very few British shipping companies were covering their running expenses, and that fewer still were able to make the necessary provision for

replacing their ships as they became out of date. This, he recognised, was not merely a shipowner's problem but concerned also the officers, engineers, and seamen, as well as the nation as a whole. If, he declared, the state of affairs he described was due to fair competition, it might be held that the British mercantile marine ought to fight its own battles, as in the past, without Government aid, but that was not the case. The increase in the mercantile marines of some other countries had been due, in large part, to the stimulus of subsidies, and financial help was being given by many foreign countries. These countries were free, of course, to adopt whatever policy they thought fit, but, from the point of view of the British mercantile marine, competition created and maintained by Government subsidy could not be regarded as fair competition and British shipowners were entitled to seek the help of their Government if they were not able successfully to defend themselves.

After recalling that the efforts of the British Government were primarily bent to the increase of international trade, and that a revival of this might be slow, Mr. Runciman made the announcement that the Government was prepared to ask the House to grant for vessels carrying tramp cargoes under tramp conditions a subsidy to be used for defensive purposes and to cost not more than £2,000,000. This subsidy was to be aimed at securing the abolition of foreign subsidies and the greater employment of British shipping and sea-farers. The conditions he laid down for its grant were that a scheme should be devised that (1) would prevent, so far as possible, the money from being dissipated in the domestic competition of British ships carrying tramp cargoes, and (2) would ensure that it was effectively directed to securing the greater employment of British tramp shipping at the expense of foreign subsidised shipping.

The subsidy, he proceeded, would entail a real measure of organisation of tramp tonnage. It would be given for one year only, and within that period would be subject to withdrawal if the circumstances which led to its introduction were altered. It would also be a condition that the shipowners, through their international organisation and in any other ways open to them, should press on the shipowners in other maritime countries the framing of proposals tending to adjust the supply of tonnage in the world to the demand, and thus to raise freight rates once more to a remunerative level.

The Government on its part, he intimated, would continue its efforts to secure international consideration of means to place shipping generally on an economic footing. It intended to communicate with foreign countries to ascertain their views on the possibilities of international measures to facilitate the abolition or reduction of subsidies, and the formulation of schemes for laying up or scrapping superfluous tonnage, or both. The Government's view was that the task of preparing the ground for and of formulating such schemes must, in the first instance, fall on the shipowners of the chief maritime countries. Mr. Runciman added that in considering the problems it was essential to have the co-operation of the Dominions and India. The position must be borne in mind not



THE ROYAL MAIL TURBINE LINER ASTURIAS.

(Built as a motorship by Messrs. Harland and Wolff at Belfast in 1925; re-engined with turbines by them in 1934.)

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only of tramp shipping but also of some of the great liner trades, especially those between different parts of the Empire, which were menaced by subsidised foreign competition. The Government was, therefore, informing the Dominions and India of the position and seeking their views as to possible lines of action.

#### SCRAP AND BUILD.

The President went on to describe proposals relating to the scrapping of ships. He remarked that the Government had been impressed by the improvements that had been brought about in the form and propulsion of cargo ships in recent years, and it was prepared, therefore, to place at the disposal of the shipping industry financial help on favourable terms for scrapping older British cargo tonnage and providing a smaller quantity of up-to-date cargo tonnage, by either the construction of new vessels or the modernisation of existing ships. The object, he explained, was to ensure, first, a reduction in the number of surplus ships which flooded the market and depressed the freight rates whenever these showed a tendency to improve, and, secondly, to maintain the high standard of efficiency which, on the whole, had characterised the British cargo fleets in the past. He made it clear that there had never been any intention of compelling any shipowner to take advantage of the scheme if he did not wish to do so.

This proposal was criticised from more than one quarter. Many shipowners had formed very unfavourable views of the working of the previous Trade Facilities Acts on the ground, partly, that they led to the construction of tonnage in advance of the real need for it and were thus disturbing factors, damaging instead of benefiting the shipping industry in the long run. The point was also made that owners who had of their own resources contracted for new tonnage might be placed at a disadvantage through the competition of owners receiving Government assistance in building. As to the flooding of the market with tonnage this, British owners alleged, was the work mostly of foreign firms. Broadly, the criticisms could be summarised in the statement that British shipowners have always been ready to contract for shipping whenever there was any prospect of their being able to employ the new tonnage, and there was no reason to suppose that they would not again come forward with their orders on any signs of trade improvement.

From the point of view of personnel an objection urged against the scheme was that it meant a reduction in the number of ships, and so in the possible opportunities for employment. Since no corresponding diminution of foreign mercantile marines could be ensured British shipping might be placed in a still more unfavourable position in relation to foreign tonnage. Officially the plan had been defended on the ground that its effects in bringing about a reduction of the British mercantile marine were quite contrary to the results of the Trade Facilities Acts, which had tended to increase the mercantile marine. However, the objections on various grounds to the proposals were somewhat allayed by the emphasis laid on

their voluntary character, and some were inclined to accept the proposals as part of the Government scheme in view of the other more attractive features. In other words, shipowners were prepared to condone something for which they had no liking in view of the benefits conferred by other parts of the scheme.

Various suggestions, the President indicated, had been put forward for the assistance of British shipping by the reservation of inter-Imperial trades, the preferential treatment of British ships or cargoes carried in them in Empire ports, preferential duties against foreign ships which had the benefit of Government subsidies, and the like. These, he added, were measures which had their own dangers, but they might have to be considered if the proposals outlined did not succeed in lessening the menace to the British mercantile marine. Finally, he suggested that with the assistance of importers and shippers, more could be done to secure a greater use of British vessels. Efforts should also be made to prevent the forcing down of freight rates by the domestic competition of British ships and to present, by fuller co-operation between British ship-owners, a stronger front to foreign competition.

#### RESPONSE BY THE INDUSTRY.

Immediately after the statement in the House of Commons the Chamber of Shipping announced that the proposals were receiving the close consideration of the shipping industry and that the Council would consider them at their next meeting. Meanwhile the proposals had been considered, broadly, at a meeting of the Tramp Shipowners' Committee, and a resolution had been unanimously passed in which the committee welcomed the acceptance by the Government of the principle of a temporary subsidy in order to help the industry in its abnormal conditions. A resolution in somewhat similar terms was later adopted by the Council on July 12 (which left it to the various committees to work out the details of a plan), and a number of important owners also assured the Government that they would do everything possible to co-operate in giving effect to the objects all had in view.

After giving their general approval to the Government proposals the tramp shipowners set to work during the following weeks, and elaborated ideas which, they hoped, would be acceptable to the Government. Their scheme came before the various sections of the industry whose representatives, both publicly and privately, urged that care must be taken to ensure that they were not in any way prejudiced by the assistance given to tramp shipping.

The discussions between the Board of Trade and the shipowners during the ensuing weeks reached a point which enabled a definite announcement to be made in the King's speech at the opening of the new Session of Parliament on November 20, that Parliament would be invited to consider a measure providing temporary assistance to the tramp section of the industry. On the same day the Prime Minister referred in the House of Commons to the proposals, saying that shipping was to be subsidised to enable it to meet the unfair

competition created by other countries which subsidised their mercantile fleets with cash. All that the Government proposed to do was to establish some measure of equality, and as soon as other countries were willing to come to some arrangement that would be fair to Great Britain it would be prepared to agree to it.

#### OUTLINE OF THE SCHEME.

Details of the scheme were published in a White Paper made available on November 30. This showed that the subsidy of £2,000,000 was to be apportioned among owners during the year beginning January 1, 1935, and would be calculated on the basis of "ton-days." For this purpose the number of tons gross included in each of the accepted claims would be multiplied by the number of days included in the claim and the sum of the products would be taken. The total amount fixed for distribution in each quarter or year would then be divided among owners in proportion to the number of ton-days credited to each. The scheme applied only to vessels carrying cargo on the terms of a charter party. The owners of cargo liners considered that there was a case for bringing them into the scheme in order to cover certain cargoes carried on berth terms, but this would have meant an addition to the subsidy which the Government did not see its way to provide. Under the scheme, should the index number of shipping freights rise to 93 per cent. of the average rates of 1929 the subsidy would be gradually reduced until, when the average of that year was reached, nothing would be payable.

The scheme provided for a measure of organisation of the tramp shipping industry and involved the setting up of a Tramp Shipping Administrative Committee, apart from a Tramp Shipping Subsidy Committee to be formed to advise the Board of Trade regarding the administration of the subsidy. The object of the Tramp Shipping Administrative Committee was, in the main, to be the active promotion of co-operation among shipowners in minimising domestic competition, improving freight rates and conditions, and bringing about as against subsidised foreign competition the fullest possible employment of British tramp shipping. This body was to consist of twelve members, ten being elected by the Tramp Shipowners' Committee of the Chamber of Shipping and two by the Joint Liner Committee of the Chamber and the Liverpool Steamship Owners' Association. It was to consult, when necessary, with various specified bodies, including the Council of the Chamber. On December 4 a financial resolution authorising the grant of the subsidy was carried in the House of Commons by 231 votes to 52.

Modifications were also announced in the "scrap and build" proposals which had been put forward in July. Instead of three tons, as originally proposed, owners were to be required to scrap only two tons for each ton of new shipping built and only one ton for each ton of existing shipping modernised, and they were to be permitted to buy ships for scrapping from foreign owners, as well as to scrap British ships. The advances made for building or

modernising cargo ships would not exceed an aggregate of £10,000,000, or about the cost of building 1,000,000 tons dead weight of modern cargo vessels. The scheme was to be brought into effect at a date to be fixed by the Board of Trade after the necessary legislation had been passed.

#### INTERNATIONAL RATIONALISATION.

No time was lost by shipowners in endeavouring to secure a measure of international rationalisation by laying up, such as was urged by the President of the Board of Trade. The Executive of the International Shipping Conference took the lead and communicated with the various foreign shipping associations with the idea of arranging for an international meeting in London. The reception of the suggestions generally was very good. At first there seemed a possibility that a meeting in London during October might be arranged. Then November was mentioned, and afterwards it became clear that no date earlier than December would be practicable. It was hoped that delegates from the United States might attend, and American owners were much occupied during the autumn in a re-consideration of the forms of financial assistance accorded to American shipping by the United States Government.

The hopes that owners in the United States would co-operate were later confirmed. In order to ensure, as far as possible, a successful result of the Conference it was decided to proceed very carefully with the plans and so permit definite proposals to be submitted to the full international meeting of owners. Early in December the shipping associations in the principal maritime countries were invited to send delegates to a preliminary meeting in London during the week beginning on January 14. This preliminary meeting was to be concerned with the general discussion and drafting of a plan of rationalisation which, in due course, would be submitted to a full conference to be held later, also in London,

#### TROUBLES OF LINER COMPANIES.

While much attention was concentrated during the year on the troubles of tramp shipping the liner companies had their own difficulties, which varied with the particular trades in which they were engaged. One trade in which the troubles were acute was the Trans-Pacific, and they arose from the competition of highly subsidised American ships which enjoy a monopoly of the trade between San Francisco and Honolulu, but at the other end of the voyage are able to participate freely in the passenger and cargo trade between Australia and New Zealand. In September, joint announcements were made on behalf of the Australian and New Zealand Governments that they would co-operate with a view to common action to safeguard the mutual shipping interests of the Dominion and the Commonwealth.

CUTHBERT MAUGHAN.

## CHAPTER IX.

### MERCANTILE MARINE MACHINERY

IN the review of marine engineering published in the last issue of "Brassey," it was stated that there were hopes that the long period of depression was at last showing some evidence of coming to an end, as a number of orders for mercantile vessels had been placed just before the publication of the volume. While this good start was not consistently maintained, the early part of 1934 exhibited similar characteristics, as there was quite a spate of orders for special types of ships—chiefly motor-driven refrigerated food-carriers for Dominion transport—placed principally with North of Ireland firms, together with a welcome increase in the orders for tankers, in the demand for which there had been a very pronounced lull for three or four years. This was followed by the lifting of the suspension of the work on the new Cunard White Star liner Queen Mary in April, and by the ordering of a number of cross-channel vessels of varying sizes. Orders for tramp steamers, however, remained on a very restricted scale, only a very few owners having decided to acquire new and up-to-date tonnage. Possibly one of the principal reasons was the natural tendency to await developments in the Government's proposals for the relief of the tramp shipping industry.

From Table I, which gives the tonnage and horse-power under construction as at June for the last three years, it will be observed that the figures last year were very much more encouraging. So far as steam tonnage is concerned, Great Britain, France, Germany, and Japan are the countries which contributed chiefly to the improvement, while in motorships Great Britain, Holland, Italy, and Japan showed the most notable increase. The total horse-power of steam machinery installations increased principally in this country, France, Germany, and Japan, and of motor machinery in Great Britain, Germany, Italy, and Japan.

While the figures for home production appear to postulate much greater activity, it may be recalled that whereas in the previous year 134,000 tons of steamers and 6,000 tons of motorships were in a state of suspense, the corresponding figures for June, 1934, were 59,318 tons and 6,578 tons, the drop in steamer tonnage being accounted for principally by resumption of work on the new Cunard White Star liner.

In last year's review the causes militating against expenditure on modernising vessels of moderate age to make them more efficient were pointed out. Nevertheless, there have been some instances, detailed hereafter, in which such modifications have been undertaken, and it is expected that the new Government schemes for assisting the tramp and trawler industries will accentuate the demand

for those rejuvenating measures which can be readily applied to the large volume of tonnage that is still relatively young. In the meantime, ship and engine builders must still look to warship programmes to keep their yards and works in even partial operation.

TABLE I.  
TONNAGE UNDER CONSTRUCTION IN CHIEF SHIPBUILDING COUNTRIES.

	STEAMERS.			MOTORSHIPS.		
	June, 1932.	June, 1933.	June, 1934.	June, 1932.	June, 1933.	June, 1934.
Great Britain . . .	245,370	205,804	307,510	34,780	81,118	279,632
France . . . .	84,740	72,286	91,180	43,390	20,120	13,320
Germany . . . .	2,200	3,005	47,545	101,300	46,850	43,600
Holland . . . .	435	435	3,435	48,140	31,288	51,330
Belgium . . . .	—	—	—	4,860	3,200	3,670
Italy . . . .	101,520	—	970	79,050	27,076	46,700
Norway . . . .	1,840	6,730	11,235	9,260	2,680	5,816
Sweden . . . .	5,830	1,372	—	83,370	76,860	49,025
Denmark . . . .	2,925	7,360	9,200	17,450	19,823	57,450
Japan . . . .	19,850	8,100	20,600	23,820	74,180	116,680
Spain . . . .	—	3,860	3,924	33,270	29,652	16,668
U.S.A. . . . .	161,400	1,800	18,600	800	503	6,319
<b>Total . . . .</b>	<b>626,110</b>	<b>310,752</b>	<b>514,199</b>	<b>479,430</b>	<b>443,150</b>	<b>690,210</b>
Change compared with 1932 . . . .	—	-50½%	-17½%	—	-7½%	+44%
Change compared with 1933 . . . .	—	—	+66%	—	—	+56%

HORSE-POWER UNDER CONSTRUCTION.

	STEAMERS.			MOTORSHIPS.		
	June, 1932.	June, 1933.	June, 1934.	June, 1932.	June, 1933.	June, 1934.
Great Britain . . .	290,970	262,333	402,908	22,310	62,884	276,311
France . . . .	196,800	166,540	231,300	33,390	15,660	11,510
Germany . . . .	4,450	8,052	66,577	90,650	38,969	79,031
Holland . . . .	1,450	1,585	5,450	39,540	87,038	69,700
Belgium . . . .	700	—	—	20,200	17,000	17,000
Italy . . . .	237,000	—	—	60,800	15,200	57,500
Norway . . . .	700	2,800	4,500	3,000	5,800	7,800
Sweden . . . .	6,300	1,450	1,600	65,410	65,675	74,642
Denmark . . . .	3,175	4,250	5,100	18,200	13,928	48,580
Japan . . . .	15,200	7,000	15,200	22,700	73,200	125,080
U.S.A. . . . .	182,200	1,000	—	5,710	4,876	11,165
<b>Total . . . .</b>	<b>923,745</b>	<b>455,010</b>	<b>732,725</b>	<b>390,910</b>	<b>400,230</b>	<b>787,919</b>
Change compared with 1932 . . . .	—	-50·5%	-21%	—	+2½%	+10²%
Change compared with 1933 . . . .	—	—	+60%	—	—	+96%

## PROPELLION PROBLEMS.

Intimately connected with the development of marine machinery are the problems involved in producing the most economical form of hull in order to reduce the power of the machinery needed for a specified speed, and the past year witnessed a flood of contributions to the scientific societies on the various aspects of the inter-relation of form and machinery.

At the Spring Meeting of the Institution of Naval Architects there were papers from the tank authorities at the National Physical Laboratory on screw propellers of varying blade section and on appropriate lengths of ships for maximum seaworthiness. Messrs. Denny's tank expert contributed a paper on the scale effect of screw propellers, Professor Bragg one on form efficiency, and Dr. Lamble one on velocity distribution around a ship's model.

The Summer Meeting of the same institution consisted of a symposium in which the heads of various British and foreign experiment tanks took part. It produced a varied and valuable collection of papers dealing with form, frictional resistance, effect of inclination and scale, ship performance in relation to tank results, wave resistance, and other cognate matters, and followed an earlier conference called by the Friends of the Hamburg Experiment Tank, at which a number of papers on allied subjects were followed by others read during a visit to Scotland in association with the Institution of Engineers and Shipbuilders in Scotland.

The completion of the propeller tank at the National Physical Laboratory—the gift of Sir James Lithgow—will further contribute to the solution of the many problems connected with ship propulsion.

Apart from all this, a most interesting experiment on a full-size scale was undertaken by Sir Joseph Isherwood, who, in three ships built in accordance with his Arcform design, put his ideas into practice. The results of his experiments were given in a paper to the North-East Coast Institution of Engineers and Shipbuilders. In these ships, from the results so far published, the Admiralty co-efficient, which is a measure of the propulsive efficiency, ranges from 370 at  $9\frac{1}{2}$  knots to 385 at  $11\frac{1}{2}$  knots at sea—a very remarkable performance.

In the endeavour to improve propulsive efficiency a number of major modifications to normal form have been carried out. In Holland several vessels have had their forward ends replaced by the Maierform design, and in England a similar alteration has been adopted for the City of Dieppe, the Hazelwood of Messrs. Constantine and the Napier Star of the Blue Star Line. Streamlining of the stern post and rudder, directing fins, and various forms of propeller such as the Scimitar and Unislip, have also had a considerable vogue, all with the object of reducing the expenditure on fuel.

On the machinery side, there is not much to record in the way of novelty, but mention may be made of the application of Diesel-electric drive to paddle wheels, with chain transmission from the motors to the wheels, as fitted in the two Firth of Forth ferry boats Robert the Bruce and Queen Margaret; the adoption of Diesel-

electric propeller drive for the Highland mail steamer *Loch Nevis*; the first German application of turbo-electric drive to the N.D.L. liner *Scharnhorst*; and the Voith-Schneider system of propulsion of which a number of examples have been fitted on the Continent. In most of these instances, greater care than was formerly the case has been devoted to ensuring the maximum suitability of the machinery to the type of ship in which it is installed, so as to make the whole a well-balanced entity. It is due to progress on the part of the machinery builders that this desirable end can now be readily attained.

#### BOILERS AND FUEL

It was noted last year that there was a decided tendency, particularly in cross-channel steamers, to fit coal-fired boilers, the fuel for which was distributed over the grates by mechanical means, and that this system was being supplied to the Babcock-type boilers in the Stranraer-Larne steamer then under construction by Messrs. Denny. This vessel, the *Princess Maud*, is now in commission, and it has been remarked that combustion is so good that it is difficult to believe that the boilers are not oil-fired. The new Fishguard-Waterford steamer *Great Western*, built by Messrs. Cammell Laird and Co., has been similarly equipped and with equally successful results. In both these cases stokers of the Erith-Roe type have been supplied, and plant of the same design is being fitted in a new Heysham-Belfast boat, ordered in the summer by the L.M.S. Railway from Messrs. Harland and Wolff. The train ferries Twickenham Ferry, Hampton Ferry, and Shepperton Ferry, built for the Southern Railway by Messrs. Swan, Hunter, have boilers of the Yarrow type and also mechanical stokers, but of the Taylor retort-type. In all these cases manual labour is required for transferring the coal from the bunkers to the hoppers which feed the stokers, but no skilled firing over the grate area is necessary, this duty being entirely undertaken by the mechanical gear. The result is absolute control of the firing rate and elimination of the necessity to open the fire doors for the introduction of fuel. It has been stated that certain of the Canadian Pacific "Beaver" steamers in which mechanical stokers are fitted cross the Atlantic with practically no variation of the boiler pressure throughout the voyage, no drop, as is inevitable with hand-firing, occurring during fire cleaning.

So far, in this country, the application of mechanical firing to Scotch boilers has made practically no advance, and there appears to be little prospect that it will unless the fuel is pulverised before firing. There have been practically no developments of powdered coal-firing in this country, although some work has been carried out in Germany. It is believed that one of the pioneer vessels, so equipped in the early stages of development work, has had her plant removed, principally because of the difficulty of utilising poor Indian coal.

Boiler pressures do not show much tendency to rise, 250 lb. being the usual limit for Scotch boilers, although 275 lb. is being used for the new Ellerman Line steamer on order from Messrs. Cammell



THE SHAW, SAVILL AND ALBION MOTOR LINER WAIWERA.

(*Builders, Messrs. Harland and Wolff, Belfast.*)

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Laird and Co. Exceptionally, Benson boilers working at 710 lb., with a temperature of 873 deg. F., have been adopted for two new Hamburg-Amerika steamers, the plants being supplied by Messrs. Blohm and Voss and the Vulcan Company respectively. The latter firm are also interested in the development of the Wagner drum-type high-pressure boiler, of which an account was given by Dr. Bauer during the German visit to Scotland in the summer. The critical pressure boiler fitted in the Uckermark, which formerly generated steam at about 3,000 lb. and supplied it to the turbine reduced to about 1,200 lb., has had its working pressure reduced to little above that of the turbine.

For a new Booth Line steamer ordered from Messrs. Cammell Laird, boilers of the Howden-Johnson type have been specified. In these boilers a plain cylindrical portion carries the furnaces and smoke tubes, and the combustion chambers are formed from a series of water tubes extending from above the smoke tubes to the bottom of the main cylindrical drum, somewhat on the principle of the Prudhon-Capus type. As far as is known there has been no further application of Johnson boilers to mercantile work beyond those built for the Royal Mail Asturias and Alcantara by Messrs. Harland and Wolff in connection with the substitution of steam turbines and single-reduction gearing for internal-combustion engines in these vessels.

Papers on the Velox design of steam generator, which was mentioned in last year's review, were read to the Institution of Mechanical Engineers in Liverpool by Mr. Swallow of Messrs. Richardsons Westgarth, who are sponsoring the development of this remarkable innovation in this country, and by the Chief Engineer of the Brown Boiler Company. Although four land plants are in service on the Continent and a number are under construction, none has so far been fitted on shipboard, though it is understood that three sets have been ordered for foreign Navies, while the British Admiralty has also ordered an experimental plant of very considerable size.

The Wallsend Slipway Company have been carrying out trials on a small high-pressure oil-fired water-tube boiler designed by Mr. Woolnough, principally for locomotive work, the evaporation rate of which is very considerably higher than normal practice, but as far as is known it has not yet been fitted for ship use.

#### RECIPROCATING ENGINES.

The plain reciprocating engine retains its position of prime favourite for the general run of mercantile tonnage and in June there were 74 of them under construction, as against 14 turbine sets. For the most part these engines are of standard design, but there is a steadily increasing tendency to raise the initial steam pressure and temperature and to utilise poppet valves, particularly in the high-pressure cylinder. The North Eastern Marine Company have supplied a number of such engines, including that in the Isherwood Arcform ship Arcwear, which uses steam at 630 deg. F. Messrs.

Stephen's three-cylinder compound engine with hydraulically (oil) operated balanced slide valves has been adopted for the new Maclay-McIntyre steamer *Loch Ranza* and for a vessel building for Messrs. P. and W. Henderson at Meadowside.

On the Continent, where highly superheated steam is more general practice than in this country, several vessels have been fitted with the Lentz, Christiansen and Meyer, and Burmeister and Wain types of engine, all of which exhibit departures from the usual slide valve-Stephenson link gear practice, and a number of small lagoon vessels in service in Italy have had Caprotti valves and gear fitted with great success to engines running at about 300 r.p.m. In the quite considerable number of cases of conversion in which superheaters have been added to the boilers, it has been common practice to replace the high-pressure cylinder and its slide valve by poppet valves of the N.E. Marine, Lentz, or similar design, notable examples being the P. & O. *Ranpura* and the *Fordsdale*. A number of small cargo steamers and certain paddle vessels have had the Andrews and Cameron cam-operated balanced slide valves fitted, among them being the two cargo boats built by Messrs. Barclay, Curle for the Leith-Hamburg trade of Messrs. Currie.

#### EXHAUST STEAM TURBINES.

The exhaust steam turbine continues to maintain its popularity as a fuel-saving adjunct to the reciprocating engine, and it was applied in considerable numbers during the year to both existing and new vessels.

On the Bauer-Wach system, which so far claims the largest number of units in service or on order, there may be cited the following examples. Of new ships there were two steamers for the Booth Line ordered from Messrs. Cammell Laird and Co., and the *Lech*, a cargo steamer for Polish owners, commissioned by Messrs. Swan, Hunter. The latter firm also installed a small set specially designed for trawlers in the Hull fishing boat *Kingston Cornelian*; this set works in association with a compound engine, and the combination gives a very low fuel consumption, stated to be  $\frac{1}{2}$  ton a day less for an extra two knots of speed as compared with sister trawlers. This is a very valuable feature for long-distance trawlers, as the bunkers are considerably reduced and the radius of action much increased, while it becomes possible to increase speed to catch a market. A large number of trawlers, both new and converted, have been so equipped in Germany, and it is possible in view of the renewed activity in trawler building that this system will acquire great popularity. Among conversions of existing machinery to the Bauer-Wach system, possibly the most notable examples recently undertaken are the *El Biar* for the Compagnie Navigation Mixte, the *Champollion* and *Mariette Pacha* for the Messageries Maritimes, the *Niederwald* and *Steigerwald* for the Hamburg-Amerika Line, and a group of eleven vessels for the Hansa Company. Several other German cargo vessels and some small Norwegian ships have had this design of exhaust steam turbine fitted.

Among other systems, it is believed there have been no further examples of the Brown-Boveri and Parsons designs completed, but a group of six vessels for the Ellerman Line—Cities of Venice, Kimberley, Salisbury, Oran, Wellington, and Eastbourne—have been converted by Messrs. Workman Clark to the exhaust turbo-electric system.

Messrs. Rowan applied the Gotaverken system to some Clyde-built cargo steamers, and Messrs. White, of Newcastle, put into service the Adderstone, formerly a double-reduction geared-turbine vessel. In place of the high-pressure turbine unit a geared reciprocator has been installed, exhausting into the existing low-pressure turbine, which has been suitably modified for the purpose. The published results of the converted plant show very favourable figures, it being calculated that the overall thermal efficiency is of the order of 78 per cent. of that possible on an adiabatic heat drop. The engine, a four-cylinder double compound running with partially forced lubrication at 300 r.p.m., is fitted with piston valves and Stephenson link gear, and its good performance could undoubtedly have been bettered by employing poppet valves and a rotary operating gear, which, besides lending themselves more favourably to high superheat, considerably improve the mechanical efficiency by the elimination of the piston valves and their operating gear, to which it is almost impossible to apply forced lubrication satisfactorily.

#### STEAM TURBINE INSTALLATIONS.

It is very remarkable that, apart from such high-powered installations as those for the Strathmore and Orion building at Barrow for the P. & O. and Orient Lines respectively, for the converted Alcantara and Asturias, for the Cunard White Star liner Queen Mary, and for cross-channel steamers, the number of turbine-driven plants under construction in Great Britain at the end of September was three. They comprised a steamer for the Ellerman Line by Messrs. Cammell Laird, a Brocklebank liner by Messrs. Hamilton, Port Glasgow, and a Manchester liner at Blythswood, the two last with Rowan machinery.

Double-reduction gear has almost entirely lost its popularity, though the Parsons Marine Steam Turbine Company have designed and tested at their works a "Simplex Unit," intended for cargo steamers of moderate power, which comprises high-pressure and low-pressure turbines with double-reduction gear and condenser as a single unit, ready for installation on board. The gearing is of the single helical type. For practically all Admiralty work, except of the smallest powers, turbines with single-reduction gear remain the standard type of plant, as also for relatively high-powered cross-channel steamers, where weight is of vital importance. In practically all high-powered ships the boiler pressure is of the order of 425 lb. per sq. in., the steam being generated in water-tube boilers and used in association with steam temperatures of about 700 deg. F.

Advances have been made in materials of construction, notably the more general use of stainless iron for blading subjected to high

temperatures, pressures, and stresses, and the employment of modified forms of gearing, such as the Vickers-Bostock-Bramley and the Parsons all-addendum type, whereby higher specific loadings can be safely employed with reduced width of tooth face.

Good progress has been made with the French turbo-electric Normandie, and it would appear likely that she and the Queen Mary will go into commission within a few months of each other. The comparative sea performances of the two vessels are awaited with great interest, but it is believed that the French ship has a considerable reserve of boiler power, and it is a well-known fact that Continental installations are much more highly rated than is customary in British practice. It has been stated that the Normandie will develop 160,000 h.p. with four boilers out of commission, and as it is understood that the number of boilers is thirty, the output with all boilers in operation would be of the order of 185,000 h.p. The legend power of the Queen Mary is 180,000 h.p.

It is a matter of great interest that the P. & O. Company in their new Strathmore, under construction by Messrs. Vickers-Armstrongs, should have reverted to single-reduction gearing and Babcock boilers after their highly satisfactory experience with turbo-electric drive and Yarrow boilers in the Strathaird and Strathnaver.

#### INTERNAL-COMBUSTION ENGINES.

It was noted last year that there were distinct indications of the revival in popularity of the internal-combustion engine, and reference to the table on p. 336 will show that the world figures for horse-power under construction are nearly twice those of the previous year and that the total exceeds that of steam-driven machinery by about 7½ per cent. The figures for Great Britain are very remarkable, the power having increased more than four times, due principally to the large group of special food-carrying vessels under construction in Belfast and to the revival in Diesel-driven tanker tonnage. In the autumn of 1934 a dozen large tankers for the Anglo-Saxon Petroleum Company and the Eagle Oil and Shipping Company were building in this country, besides a number in Germany, Holland, and Sweden. Those in Britain were all being fitted with four-cycle engines of the Werkspoor or Burmeister type manufactured by the licensees of those firms here.

Of food-carriers, Messrs. Harland and Wolff had in hand at Belfast three Blue Star liners—Australian Star, Imperial Star, and New Zealand Star—two with four-cycle single-acting and one with two-cycle single-acting engines, the four-cycle plants being supercharged. Further, they had three Shaw Savill vessels—Waiwera, Waipawa, and Wairangi (the last at Govan)—each having two ten-cylinder four-cycle single-acting engines with pressure induction, giving a total of 12,000 s.h.p., the supercharging being on the Büchi system.

Messrs. Workman Clark completed, at Belfast, three vessels for Messrs. Andrew Weir and Co.'s Bank Line—the Isipingo with double-acting Sulzer airless-injection engines, the first of their kind made

in Great Britain, the Inchanga with similar machinery, and the Incomati with Doxford-type engines. At the same yard two ships were turned out for the Federal Steam Navigation Company, the Durham and the Dorset, having Sulzer engines similar to those of the Isipingo but with the power increased to 11,000 s.h.p., each engine having eight cylinders instead of six. The engines for one of these vessels were made by Messrs. Workman Clark and those for the other by Messrs. Sulzer at Winterthür.

Two Commonwealth and Dominion liners under construction, one at Wallsend by Messrs. Swan, Hunter and the other at Clydebank by Messrs. John Brown, are to have Sulzer and Doxford engines respectively, while the Port Chalmers, completed for the same line by Messrs. Swan, Hunter early in the year, was fitted with Doxford engines made by Messrs. Barclay, Curle. Doxford engines have also been specified for two vessels built by Messrs. Doxford themselves for Messrs. Sutherland.

Messrs. Kincaid, of Greenock, received orders for Burmeister and Wain type two-stroke airless-injection engines, similar to those in the Malaita, for a vessel for the Melbourne Steamship Company, the hull being built by Messrs. Swan, Hunter, and for four-cycle single-acting engines for the Adelaide Steamship Company's Manoora, ordered from Messrs. Stephen, as well as for similar machinery for an Eagle oil tanker at Blythswood and a Phosphate Commissioners' ship at Messrs. Lithgows' yard.

Two large mail liners similar to the Warwick Castle, and also two smaller vessels, ordered from Messrs. Harland and Wolff by the Union Castle Line, are all to have two-cycle double-acting engines, and the same firm are to fit their Burmeister and Wain type of machinery in vessels ordered from them by Messrs. Lamport and Holt and Messrs. Elder and Dempster. Sulzer engines have been selected for a Bibby liner ordered from the Fairfield Company.

The remarkable success of the Coast Lines' coasting vessels British Coast and Atlantic Coast appears to have stimulated activity in the application of Diesel engines to small vessels of this kind, and towards the end of the year about a dozen of these small craft were in hand, as well as a similar number of Diesel-driven tugs.

In Japan the preference for internal-combustion machinery grows apace, and engines of that type under construction represent a power over eight times greater than that of the steam engines in hand.

In Italy the existing Diesels in the Saturnia are to be replaced by two Fiat engines of 11,750 b.h.p. each, following on the desire of the owners to increase the speed of the ship, and similar action is to be taken with the sister ship Vulcania.

In Holland the principal development has been the conversion of units of three large shipping companies from steam to Diesel. These consist of three vessels for the Netherlands Steamship Company—the Mapia, Madoera, and Manoeran—in which two seven-cylinder two-cycle high-speed Werkspoor engines are fitted driving propellers through reduction gearing. The engines of the first ship have Sandner hydraulic dampers, and the other two have Bibby couplings interposed between the pinions and engines. In the Siantar and

Modjokerto of the Rotterdam Lloyd and the Boschfontein of the Royal Dutch Steamboat Company the arrangements are similar, but Vulcan hydraulic couplings are introduced between the engines and gearing, similar to those fitted in the large sea-going tug Zwarze Zee. These couplings have given complete satisfaction in operation. A large new motorship, the Bloemfontein, which was launched in the middle of the year by wireless from South Africa, has Hesselman engines supplied by Messrs Stork, of Hengelo, the hull being built by the Netherlands Shipbuilding Company.

#### CROSS-CHANNEL AND ESTUARY VESSELS.

A substantial number of cross-Channel vessels were completed during the year, and their propelling machinery shows examples of practically all the variations now at the shipowners' disposal.

Of cross-Channel steamers proper the Great Western for the Fishguard route of the Great Western Railway has reciprocating engines and coal-fired Babcock boilers with mechanical stokers of the Erith-Roe type. The Princess Maud, for the Stranraer-Larne route, has similar boilers and stokers, but the engines are of the usual single-reduction geared-turbine design. The new Belfast-Heysham vessel building at Belfast for the L.M.S. Railway and the cargo steamer under construction by Messrs. Denny for the same railway are to have similar equipment, of 8,000 s.h.p. and 3,000 s.h.p. respectively, while the Isle of Man Company's Mona's Queen has the usual turbines but oil-fired boilers. A similar turbine-driven vessel has been ordered from Messrs. Stephen for Tasmania.

The Prince Baudouin, put into service in August on the Dover-Ostend route of the Belgian State Railways, has two 12-cylinder single-acting oil-engines of the Sulzer type. Each is of 8,500 b.h.p., and together they suffice to give the ship a speed of over 25 knots, making her the fastest sea-going vessel in the world driven by internal-combustion engines. In the Loch Nevis, a Denny production for Messrs. MacBrayne, the Diesel-electric equipment is somewhat on the lines of their previous vessel, the Loch Fyne, but the Diesel engine, of the Davey-Paxman type, has six cylinders in lieu of five and elaborate arrangements are made to reduce vibration to a minimum.

In a number of paddle steamers that have been put in service, the engines are of the usual diagonal type but of triple-expansion design, the two-cylinder compound engine now being the exception rather than the rule for this class of vessel, except for extremely small powers. Two such vessels were commissioned for the Clyde service, the Mercury and Caledonia, and the Sandown for the Isle of Wight service, while Messrs. Gray, of West Hartlepool, received orders for two for the L.N.E. Railway's Humber ferry service, and Fairfield for a further ship for the L.M.S. Railway's Holy Loch route. A Clyde paddle vessel, ordered by the L.N.E. Railway in November to replace the Talisman, is to have Diesel-electric drive, with the motors directly coupled to the paddle shafts. Two ferries built by Messrs. Denny for the Firth of Forth have Diesel-electric

propulsion, the paddle wheels being geared down from the motors by chains. This design is reported to have given very satisfactory results. A similar installation, but of larger power—two 530 h.p. Sulzer engines running at 400 r.p.m.—has been adopted for the Swiss Lake vessel Génève, recently converted from steam drive. The Voith-Schneider system of propulsion was applied to Lake Constance steamers in powers ranging from 500 to 800 h.p., and equipments for four sea-going vessels of 1,800 h.p. were ordered.

#### SKILLED LABOUR.

In the issue of "Brassey" for 1931, it was remarked that "The lack of apprentices entering the works and subsequently proceeding to sea as engineers and the emigration of skilled tradesmen are most serious matters from the national point of view, and their effects on the prosperity of an Empire whose fortunes are closely bound up with its sea-borne trade do not appear to receive the consideration they deserve." It is gratifying to note that Mr. R. L. Scott, speaking at the launch of H.M.S. Galatea at Greenock in August, and later Mr. Henry Robb, at a launch at Leith, both emphasised this point. In spite of the apparent improvement, as shown by the volume of work in hand and by the reduction in unemployment figures, the present situation must be a matter of extremely serious concern, not only to those directly connected with shipbuilding and engineering but to the whole community.

The reduction in the number of future potential skilled operatives is due in part to the lack of an even flow of orders during the post-War period of depression, and in part to the very poor inducements for lads to enter into a long period of apprenticeship, only to find at the end of their indentures that their skill commands a wage quite disproportionate to that obtainable in unskilled or sheltered trades. Furthermore, continued unemployment has led many of the older skilled engineers to leave their trades in despair and endeavour to find a livelihood in other spheres. This dispersal, combined with the inadequate number of younger entries to replace them, has involved not only the serious depletion of staffs, but, in consequence, also the reduction of manufacturing facilities which during the War were of inestimable value to the country. Should there arise in the near future a heavy emergency demand for either mercantile or naval work, a very considerable time would elapse before an efficient producing organisation could be again built up. Only a revival of trade, which would imply a reasonable security of tenure, coupled with an improvement in the rewards of their skilled labour, will stimulate the flow of the rising generation into an industry in which in the past this country has been pre-eminent. It is to be hoped, therefore, that the pronouncements mentioned above by two of the leading British shipbuilders will be followed by wide reverberations, and that the slight improvement discernible in the activities of the industry will not be stemmed in the next few years—as at the moment seems to be more than a possibility—by lack of staffs of adequate numbers, skill, and experience.

R. J. BUTLER, M.Inst.N.A.

## CHAPTER X.

### NOTABLE MERCHANT SHIPS OF THE YEAR.

INSTEAD of the miscellany of small, even though technically interesting, range of tugs, ferries, trawlers, and so on which formed the main subject of last year's review, the shipyards in 1934 were better occupied with a number of larger vessels for overseas trade. The largest of all was the Queen Mary. She was named by the Queen at Clydebank on September 26, and there was another royal launch on December 7, when the Orion, for the Orient Line, was put into the water at Barrow-in-Furness by the Duke of Gloucester, by wireless from Australia.

The Queen Mary, with her tonnage of something like 73,000 gross tons and an over-all length of 1,018 ft., is a unique vessel, and the circumstances surrounding her evolution are too well known to need recapitulation. It may be that she will recover for this country the Blue Riband to which, rightly or wrongly, the general public—at no expense to themselves—attach so much importance in the maintenance of national prestige. Certainly the battle will be waged very closely with the French liner Normandie. Except for some generalities, very little is really known of her main features, notwithstanding the wealth of minor detail vouchsafed to the public. At her launch on the Clyde in September nothing was said with definiteness as to her tonnage, and the Cunard White Star Line was equally reticent about her passenger accommodation and the horse-power of her single-reduction geared turbines. It is known that about 15 miles of piping had been installed up to the time of the launch; that the four propellers weigh 35 tons each and the anchor cables 145 tons; and that the 24 Yarrow water-tube boilers are to work at a pressure of 400 lb. per sq. in. For the major issues with which the public are concerned, such as speed and the surprises which presumably will make a special appeal to her passengers, they must wait until later, and certainly until the Normandie has revealed her secrets.

### REFRIGERATED MOTORSHIPS.

The Queen Mary is an exceptional vessel built for a special service, but the shipyards of this country were not idle in other directions, and many interesting, what might be called "general utility," liners were built. The re-awakening of trade with New Zealand, particularly, and to some extent with Australia resulted in the placing of a number of valuable contracts for coping with the exports of meat and dairy produce from the Dominion, and also for taking advantage of recent researches which have shown that in an

atmosphere containing carbon dioxide chilled beef can now be brought from New Zealand.

The Port Chalmers, built by Messrs. Swan, Hunter and Wigham Richardson for the Commonwealth and Dominion Line, was one of the earliest of the series of motorships for the carriage of refrigerated produce from New Zealand to be completed during 1934, and she sailed on her maiden voyage from London at the beginning of the year. The growth of this branch of Dominion trade is indicated by figures published about that time, which showed that the exports in 1933 of lamb and mutton were double those for the previous year. In about ten years butter exports from New Zealand had increased by over 100 per cent. and cheese by 68 per cent. This extraordinary development, no doubt, further stimulated the building programme of the Commonwealth and Dominion Line and later of the Shaw, Savill and Albion Line, the Federal Steam Navigation Company, and the Blue Star Line. The last named is a new entrant to this trade, and its action was probably prompted by prospective restrictions, through quotas, of exports from South America. The Port Chalmers was, in general, a successor of several ships which the Commonwealth and Dominion Line had ordered systematically over a period of years, and her completion was followed by the placing of other contracts. She is about 487 ft. long, carries about 11,610 tons and is propelled by Barclay Curle-Doxford engines, the designed speed being 15½ knots on 27 ft. draught. The total insulated space is 465,000 cu. ft., and various temperature controls enable frozen meat to be carried at about 12 deg. F., chilled meat at 29½ deg. F., fruit at 34 deg. F., and cheese at 44 deg. F.

In October, Messrs. John Brown and Co. launched from the slip next to that vacated by the Queen Mary the Port Wyndham, also for the Commonwealth and Dominion Line, slightly larger than the Port Chalmers, and a similar vessel, the Port Townsville, is being built at Wallsend by Messrs. Swan, Hunter and Wigham Richardson. In the former vessel are engines of the Doxford opposed-piston type and in the latter are Sulzer type engines. Both ships will have a service speed of about 16 knots.

The first of the three 11,000-ton Blue Star liners, the Imperial Star, was launched in October from the Belfast yard of Messrs. Harland and Wolff, and orders for three more were placed, making six in all for this company. The three Blue Star liners building side by side at Belfast were the Imperial Star, Australia Star, and New Zealand Star. About the same time the Wairangi was being put in the water at Messrs. Harland and Wolff's Govan yard ; she was the last of three ships, also of about 11,000 tons, ordered by the Shaw, Savill and Albion Line, the others being the Waiwera and Waipawa.

The group of similar vessels for the Federal Steam Navigation Company is represented by the Durham, a twin-screw motorship 565 ft. long with Workman Clark-Sulzer engines giving a speed of 16 knots, which was launched from the yard of Messrs. Workman, Clark and Co. in June. The Dorset, by the same builders, is a sister ship, though her Sulzer engines were made at Winterthur.

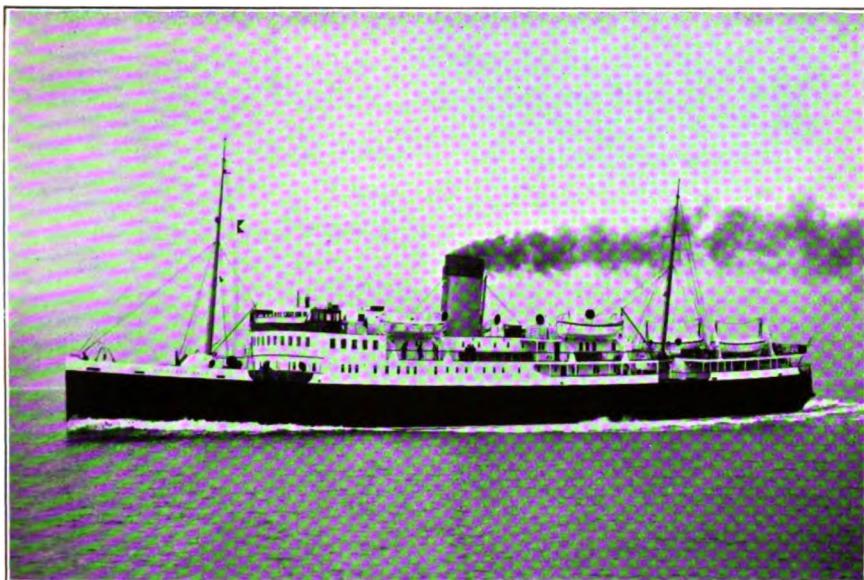
## ISHERWOOD ARCFORM DESIGN.

The first of three ships which provoked great technical interest, the Arcwear, was completed in January, and was followed later by the Arctees and Arcgow, all to Sir Joseph Isherwood's Arcform design. The Arcwear was built by Messrs. Short Bros., Sunderland, and the Arctees by the Furness Shipbuilding Company, Haverton-Hill-on-Tees, steam reciprocating machinery in each case being supplied by the North Eastern Marine Engineering Company, Wallsend. The Arcgow was built by Messrs. Lithgows, Port Glasgow, and engined by Messrs. David Rowan and Co., Glasgow. The ships were built after a long series of tests in the William Froude tank at Teddington, the object being to provide a form having a smaller resistance than a corresponding hull of normal form and giving, on relatively smaller dimensions, a greater carrying capacity. The Arcwear and Arcgow are of the short bridge type with forecastle and poop, and the Arctees, of the long bridge type, carries about 200 tons more cargo. On a length of 362 ft., an extreme breadth of 57 ft. 6 in., and a load draught of 22 ft. 7½ in. the Arcwear carries 7,068 tons.

## PASSENGER AND CARGO VESSELS.

Of four passenger and cargo steamers for the Chinese coastal trade of the China Merchants Steam Navigation Company, two, the Hai Yuan and the Hai Li, were built at the Neptune Yard of Messrs. Swan, Hunter and Wigham Richardson, Walker-on-Tyne, and two, the Hai Heng and Hai Chen, by Messrs. Barclay Curle and Co., at Glasgow. Their launching ceremonies were conducted in Chinese fashion, accompanied by the firing of crackers to ward off evil spirits. They are vessels about 343 ft. long carrying about 3,200 tons on a draught of 17 ft. 6 in. There is accommodation in steel deckhouses on the bridge deck for 20 first-class passengers, on the bridge 'tween deck for 52 second-class, and on the poop for 28 third-class, in addition to space for about 900 deck passengers. Special structural arrangements have been made to combat piratical attacks, including the partitioning of the passenger spaces with bullet-proof steel bulkheading and the provision of steam jets for defensive purposes. The vessels are propelled by triple-expansion steam engines, the boilers, operating at a pressure of 200 lb. per sq. in. with moderate superheat, being specially constructed to burn Chinese coal under forced draught.

Messrs. Alexander Stephen and Sons launched at the end of August the single-screw cargo steamer Loch Ranza, built to the order of Messrs. Maclay and McIntyre, Glasgow. This vessel is particularly interesting as being the first to be fitted with propelling machinery consisting of the Stephen patent three-cylinder compound steam engine. Steam is supplied from three cylindrical boilers, fitted with smoke-tube superheaters and turbulent airheaters. The ship is about 412 ft. long and is of the shelter deck type, designed to carry a deadweight of about 9,100 tons. She was the third cargo steamer to be launched within a few weeks for Messrs. Maclay and McIntyre.



THE LONDON, MIDLAND AND SCOTTISH RAILWAY'S CROSS-CHANNEL  
TURBINE STEAMER PRINCESS MAUD.

(*Builders, Messrs. William Denny and Bros., Dumbarton.*)



THE BELGIAN STATE RAILWAY'S CROSS-CHANNEL MOTORSHIP  
PRINCE BAUDOUIN.

(*Builders, Société Cockerill, Seraing.*)

NO. VIII.  
AMERICAN.

The Bank Line (Messrs. Andrew Weir and Co.) took delivery from Messrs. Workman, Clark and Co., Belfast, of three passenger and cargo motorships for their service from India and Burma to South Africa and Ceylon. These are the Isipingo, Inchanga, and Incomati. The largest passenger ships in the company's fleet, they were designed with a gross tonnage of 7,100 tons and a deadweight capacity of 8,000 tons. There is accommodation for 50 first-class passengers, 20 second-class, and 500 natives. Two of the ships are propelled by two sets of Workman Clark-Sulzer Diesel engines each developing 2,400 b.h.p. and giving a service speed of 15 knots. There is about 19,500 cu. ft. of insulated cargo space, with special facilities for the carriage of fruit from South African to Asiatic ports. The Incomati, the last of the three, is rather longer, and her deadweight capacity is about 8,000 tons. She is propelled by two sets of Doxford opposed-piston engines.

In furtherance of their policy of building new tonnage for the development of their trade between Jamaica, Central America, London, and European ports, the Jamaica Banana Producers Steamship Company, Jamaica, took delivery from Messrs. Lithgows of the Jamaica Producer, a single-screw steamship with a speed of about 17½ knots. The refrigerating plant can cope with the cooling of a cargo of 18,000,000 bananas. The ship carries 12 passengers, for whom a swimming bath has been provided in addition to other amenities.

#### MAIERFORM SHIPS.

The first of two motorships ordered in 1933 by the Holland-Africa Line, the Bloemfontein, ran trials on October 20, her launch in June receiving special notice because, although it took place at the Netherland Shipyard, Amsterdam, the function was controlled by wireless from Pretoria. These vessels are for the passenger and cargo service of the United Netherland Navigation Company between Northern European ports and South and East Africa. The Bloemfontein is 454 ft. long between perpendiculars, has a deadweight capacity of 10,500 tons, and is propelled by Stork-Hesselman Diesel engines giving a speed of 16 knots. There is accommodation for about 95 first-class passengers in addition to facilities for carrying emigrants and pilgrims. The ship is constructed to Maierform design.

Typical additions to Danish tonnage are the motorships Asta and Dora for the fleet of Mr. J. Lauritzen and the Nora Maersk for the New York-Japan-Phillipine Islands service of Mr. P. Moller, Copenhagen. The first two are for carrying fruit between Canada and South Africa, and are about 290 ft. long with 2,570 tons deadweight capacity. Burmeister and Wain trunk piston engines give a speed of 15 knots. The Nora Maersk is 482 ft. long and carries about 9,800 tons. There is accommodation for 12 passengers, and the Burmeister and Wain trunk piston engines gave a speed on trials of 16·6 knots. She has a Maierform bow.

Among other ships with Maierform bow is the Danish-built motorship Taronga, a vessel about 505 ft. long and carrying 10,500

tons on a draught of 27 ft. 4 in. She was built at the Odense shipyard for Mr. Wilh. Wilhelmsen, of Oslo, for the owner's Europe-Australian service, and is propelled by a Burmeister and Wain Diesel engine developing 8,000 b.h.p. at 105 r.p.m. Accommodation is provided for 12 passengers.

The idea of building the stokehold above the engine room, with the boilers on the main deck, received practical application in the Felix Henry, built towards the end of 1933, and in the Bencas, completed last August. Both were constructed in the Fredriksstad shipyard, the former being an oil-fired steamer of 3,700 tons dead-weight and 15 knots speed for the banana trade, and the latter a coal-fired steamer of 2,410 tons deadweight and 12½ knots speed chartered for the ground nut trade. A gain of between 6 and 10 per cent. of cubic capacity of holds is claimed, and it is considered that among other advantages is the fact that there is no heat from the boilers to corrode the tank top. Improved ventilation on the stokehold, abolition of ash hoists, and better stability conditions have also been urged in favour of the design.

Japanese shipyards have turned out a number of interesting vessels, one of particular technical novelty being the single-screw cargo motorship Shinshu Maru, 360 ft. long and carrying 6,330 tons on a draught of 23 ft. 9 in. She is the first Vulcan-gearred motorship to be built in Japan and was built and engined at the Kobe yard of the Mitsubishi Company. There are two Vickers Diesel engines each developing 1,350 b.h.p. at 420 r.p.m. and they are coupled to one propeller through Vulcan hydraulic gearing, also constructed by the builders. A speed of 16·8 knots was reached on trials.

#### CROSS-CHANNEL VESSELS.

Among cross-Channel vessels the performance of the Belgian State Railway's Ostend-Dover motorship Prince Baudouin will take a leading place. Built at the Cockerill Shipyard, Seraing, near Antwerp, she is about 370 ft. long overall, with a maximum draught of just over 12 ft. and a gross tonnage of 3,050. Although there are many novel features in the arrangement and convenience of the passenger accommodation, her principal interest lies in the installation of Sulzer Diesel engines which, on trials, gave her a speed of 25·25 knots, thus breaking the record hitherto held by the Italian motorship Victoria, and beating considerably the speed of 23·7 knots reached by the turbine steamers on the Dover-Ostend service. The Prince Baudouin is the first motorship to enter the English Channel passenger service. She has one short funnel and a peculiar superstructure designed to give the least wind resistance at her high speed.

In the summer of 1933 the Southern Railway ordered from Messrs. Swan, Hunter and Wigham Richardson three train ferries for a new service to operate between Dover and Dunkerque. They were launched last year and named respectively Twickenham Ferry, Hampton Ferry, and Shepperton Ferry. They are twin-screw vessels, turbine-driven, with Yarrow water-tube boilers coal-fired

by Taylor mechanical stokers. They have been designed to accommodate 12 sleeping cars or 40 goods wagons on four lines of rails on the train deck. Above this deck there is passenger accommodation with cabins, lounges, and restaurant. There is a garage for 25 cars. Heavier road vehicles can use the train deck, as the surface between the rails has been levelled for this purpose. The vessels have the maximum length of 360 ft. imposed by port conditions, and the draught is limited to 12 ft. 6 in. Their service speed is 15 knots. The rise and fall of tide at each terminal being as much as 20 ft., impounding basins have been designed for their accommodation instead of inclined gangways.

The Princess Maud, a twin-screw turbine steamer for the Larne-Stranraer service of the London, Midland and Scottish Railway, made her inaugural sailing in February, and attracted considerable notice at the time because she was the first ship operating in British waters to be fitted with an automatic sprinkler system in her passenger accommodation. After completion she was tested by setting a cabin alight and allowing the extinguishers to do their work. She is 330 ft. long overall, with a gross tonnage of about 2,900, and has a Board of Trade certificate for 1,250 passengers. There is sleeping accommodation for 161 first-class and 62 third-class passengers. There are no super-imposed berths in the first-class cabins, and all cabins throughout the ship, irrespective of class, are fitted with hot and cold running water. A feature of the public rooms is the provision of an enclosed observation lounge at the forward end of the superstructure. Propulsion is by Parsons single-reduction geared turbines; the boilers are of the Babcock and Wilcox type, coal-fired, with Erith-Roe mechanical stokers. The service speed is 20 knots.

The London, Midland and Scottish Railway followed up its series of vessels for the Clyde summer service, such as the Glen Sannox, Duchess of Montrose, and Duchess of Hamilton, with the Caledonia and Mercury, the former built by Messrs. Wm. Denny and Bros., Dumbarton, and the latter by the Fairfield Shipbuilding and Engineering Company. They are paddle steamers about 230 ft. long, displacing 712 tons on a load draught of 6 ft. 6 in. There is accommodation for about 1,800 passengers, the public rooms being well furnished as commodious lounges and observation rooms with large windows. Features of the vessels' appearance are the substantial single funnels, the provision of a cruiser stern, and the carriage of the deck houses well around the sponsons, thus concealing the familiar paddle boxes.

Messrs. David McBrayne followed their Diesel-electric passenger ship Lochfyne with the Lochnevis, built by Messrs. Wm. Denny and Bros., for passenger and cargo service between the Isle of Skye and the mainland. She is 175 ft. long and accommodates about 700 passengers. The main Diesel engines are of Davey-Paxman make, rated to develop 650 b.h.p. at 500 r.p.m. These are coupled to a 420-kw. generator by the General Electric Company. The engines and generators are mounted on special springs to minimise vibration.

Messrs. Cammell Laird and Co. completed in the summer the twin-

screw passenger steamer *Mona's Queen* for the Isle of Man Steam Packet Company. Rather smaller than the *Ben-my-Chree*, she is 347 ft. long and has a speed of 21 knots. The public rooms are exceptionally spacious. The first-class lounge, designed with Pullman seats at the side and large observation windows, is so laid out that these side seats can be converted to beds for night travel and each compartment isolated so as to give private cabin facilities. This arrangement supplements the number of permanent cabins on board. The ship is propelled by single-reduction geared turbines, steam being generated in oil-fired Babcock and Wilcox water-tube boilers.

#### COASTING SHIPS.

There have been introduced into the British coastal trade several interesting motor coasters designed mainly to carry cargo but with, in some cases, accommodation for a small number of passengers. The series began with the British Coast, completed last January, which was followed by the Atlantic Coast. Others are under construction. The British Coast and Atlantic Coast are similar. Built by Messrs. Henry Robb and Co. at Leith for Coast Lines, they are 230 ft. long with a deadweight capacity of 1,300 tons, on a draught of rather less than 14 ft., and have a sea speed of about 12 knots. They are very modern in their equipment and have exceptionally powerful cargo-handling gear, including a derrick which will lift up to  $7\frac{1}{2}$  tons. They are propelled by Polar Diesel engines, have electric deck auxiliaries and steering gear, and house the passengers in well-appointed two-berth cabins, with a spacious dining saloon and a smoking-room.

Two interesting coasters were constructed for the Free Trade Wharf Company. One was the *Rock*, a single-screw motorship, about 127 ft. long and of 250 tons gross, built by Messrs. R. and W. Hawthorn, Leslie and Co., at Hebburn, and driven with a Petter oil engine. The other was the *London Trader*, of 646 gross tons, also built at Hebburn, but having coal-burning steam-reciprocating engines, built by the North Eastern Marine Engineering Company, Wallsend.

From the yard of Messrs. Henry Robb, Leith, was launched the self-trimming collier *Munmorah*, built for the service of the Wallarah Coal Company, Australia. She is designed to carry 1,475 tons of cargo. Two grab cranes, one forward and one aft, each of 85 tons an hour capacity, are fitted over the holds, the cranes having a special type of four-rope grab capable of dealing with four-ton lifts. The propelling machinery consists of a set of triple-expansion engines, and the speed is 10 knots. She will be employed on the run from Catharine Colliery at Catharine Hill Bay to Sydney.

The smaller types of vessel included many powerful tugs, some large trawlers, and some yachts of special interest. The twin-screw motor yacht *Gulzar*, which Messrs. John I. Thornycroft built for Mediterranean service, for instance, had to have exceptional sea-keeping properties on a length of 116 ft. and a draught limited to 9 ft. so that she could enter the small harbours. She had to have

a cruising speed of  $10\frac{1}{2}$  knots with ability to work up to  $11\frac{1}{2}$  knots. Propulsion is by two M.A.N. four-stroke direct reversible Diesel engines built at Augsburg, and the range of cabins and public rooms is considerable for a vessel of this size.

An unusual departure for Messrs. Cochrane and Sons, Selby, who are better known for the number and variety of trawlers they construct, was the building of two high-class motor yachts, the Campeador and Wilna, the former being 90 ft. long and the latter 102 ft. They are propelled by Gleniffer oil engines with reduction gear. The exhaust gases from the engines are washed before discharge through the funnel, this system having been devised by the designer of the yachts, Mr. Norman Hart. The Campeador has a speed of  $11\frac{1}{2}$  knots.

There was also constructed at Selby, by Messrs. Cochrane, what is reputed to be the fastest trawler built in this country and, perhaps, in the world. This is the Cape Barfleur, for the Hudson Steam Fishing Company, Hull. She is also rather longer than the usual run of trawlers built at Selby, being 160 ft. between perpendiculars, with a breadth moulded of 26 ft. 6 in., a depth of 15 ft. on a gross tonnage of 457 tons. On light trials she made just under 13 knots, and on load trials she averaged 12 knots. She carries 300 tons of coal bunkers and 90 tons of ice, and in appearance differs from the accepted trawler design because of a cruiser stern and a considerable flare of the bows. On the machinery side she is noteworthy by having superheaters and feed-water heaters.

A yacht embodying several welding features is the Tamahine built by Messrs. Vosper and Co., Portsmouth. She has teak planking on electrically welded steel frames and beams, and is 62 ft. long. The main engine seatings were welded in order to minimise vibration, and altogether it is estimated that something like 1,500 lb. weight was saved in a total steel weight of six tons.

An interesting research vessel for use on the upper reaches of the Amazon, built at the Union Naval de Levante, Valencia, is the first Diesel-electric ship to be built in Spain. She is about 188 ft. long and displaces 800 tons on a draught of 6 ft. 7 in. The propelling machinery is by the Constructora Nacional de Mequinaria Electrica which is associated with the Westinghouse Electric and Manufacturing Company. The Diesel engines are of Burmeister and Wain type, and the speed of the vessel about nine knots.

#### TUGS.

The John Dock, one of the most powerful salvage tugs in the world, was the first to be completed of two ordered by the South African Railways and Harbours from Messrs. Harland and Wolff, Govan. She is 145 ft. long between perpendiculars and is propelled by two sets of triple-expansion engines developing 2,600 h.p. Steam is generated by four Babcock and Wilcox coal-fired water-tube boilers, and for long radius steaming the bunker capacity is 200 tons. There is a special towing winch taking 200 fathoms of  $4\frac{1}{2}$  in. circumference steel wire rope, and the fire and salvage pump can discharge

1,000 gallons of water a minute. The sister ship, the W. H. Fuller, was completed later in the year.

Messrs. Alexander Hall and Co. completed the four single-screw tugs Bon Voyage, Bon Secours, Bon Ross, and Bon Scot to the order of the James Dredging Towage and Transport Company, London, for Mr. Frank M. Ross of Montreal. They are about 90 ft. long and are specially strengthened forward against ice. The triple-expansion engines gave on trials a speed of about 11½ knots. The cylindrical boilers can be fired by either coal or oil. There is bunker capacity for 105 tons of coal. The tugs are equipped for salvage duties.

#### FERRY BOATS.

Two interesting Diesel-electric paddle ferry boats were put on the route for passenger and vehicular service between North and South Queensferry. They are the Robert the Bruce and Queen Margaret. They are 149 ft. long overall, 28 ft. breadth moulded, with a depth of 7 ft. 10 in. and a breadth over sponsons of 47 ft. 8 in. The load draught had to be limited to 4 ft. 3 in. Side loading for cars had to be adopted because of the arrangement of the jetties, and the shallow draught ruled out propellers for the necessary speed of 10 knots. With Diesel-electric drive it was found possible to keep all the machinery below the car deck, while a turn-table facilitates the parking of cars. The Robert the Bruce carries 500 persons and the Queen Margaret 200, the latter being sufficient for normal traffic requirements. The Robert the Bruce was the first all-electric-welded vessel to be built in Scotland. The ships were built by Messrs. Wm. Denny and Bros., at Dumbarton, the main Diesel engines being supplied by Messrs. Davey-Paxman and Co., and the electrical machinery by the Metropolitan-Vickers Electrical Company. A special wireless system has been installed by which each ship can operate a buzzer in the other, the object being to facilitate sailings as they leave the opposite piers simultaneously.

Another type of Diesel ferry was provided in three built by Messrs. Barclay Curle and Co. for the Clyde Navigation Trustees. They are 57 ft. 3 in. long overall and have a loaded draught of 4 ft. 9 in. They are flush-decked and double-ended, with accommodation for 140 passengers. They are propelled by Gleniffer high-speed oil engines developing 80 b.h.p. at 900 r.p.m. and with a Maag reduction gear of 3 : 1 ratio the propellers run at 250 r.p.m. with the maximum service speed of the engines of 750 r.p.m., giving a speed of about 7 knots.

The all-welded barge Poughkeepsie Socony of 1,242 gross tons for the Socony Vacuum Oil Company was built at the Staten Island Plant of the United Dry Docks Company and is claimed to be the largest all-welded vessel built in the United States. She is the third of three sister ships launched last year at the Staten Island Plant. Her sister vessels, the New Haven Socony and the Plattsburgh Socony, are built to orthodox riveted design and all three are to be used for the carriage of petrol in the service New York State Barge Canal-Great Lakes-Atlantic Coast. An interesting feature in the

construction of the Poughkeepsie Socony is that, with few modifications, the ordinarily accepted forms of framing were adopted, except for the stem and stern frame and a few minor details. The welded vessel is about 50 tons lighter than her sisters.

A few oil tankers were built during the year. One, the Criollo Fiel, attracted considerable notice because the contract was accepted by the Furness Shipbuilding Company, Haverton Hill, to build the vessel of about 5,000 tons carrying capacity within 4½ months, with a stiff penalty clause of £100 a day in the case of non-fulfilment in time and with no allowance for bad weather, strikes, or other contingencies. The keel was laid in February, the launch took place on May 15, and the ship was handed over on June 8, after acceptance trials had been run, to Sir Joseph Isherwood who was acting on behalf of the Cia. Transportadora de Petroles, who will use her on the River Parana. Twin sets of triple-expansion engines with oil-fired Scotch boilers give a service speed of 10½ knots.

A.M.I.N.A.

## CHAPTER XI.

### THE ROYAL NAVAL RESERVE.

IN 1934 the Royal Naval Reserve completed the seventy-fifth year of its existence. It was the Naval Reserve Act of 1859 that authorised the enrolment of merchant seamen of suitable age and qualifications as volunteers to undergo naval training. In the same year the first recruit joined the new force at Bristol.

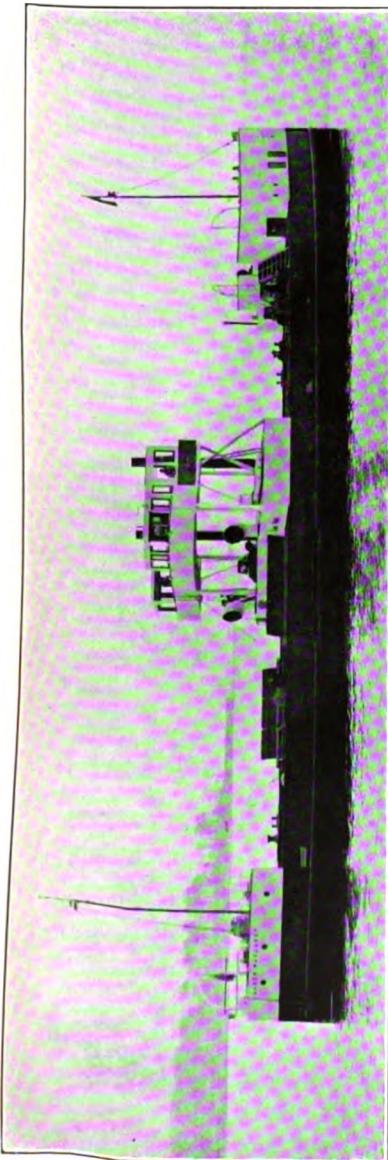
In a certain sense the Royal Naval Reserve can claim to be as old as the Royal Navy itself, since the Mercantile Marine has invariably constituted the main reserve of the senior service in times of stress. Between 1914 and 1918 this truth again became apparent, the Royal Naval Reserve almost quadrupling its strength by temporary entries from the Merchant Service.

### THE R.N.R. IN PRE-WAR DAYS.

Though provision was made in the 1859 Act for an establishment of 20,000, it was many years before this strength was attained. In 1861 and 1863 supplementary enactments were passed to constitute a reserve of officers. In consideration of an annual retainer, officers and men were required to undergo training in drillships stationed at the principal ports. Until early in the present century, the majority of these drillships were veritable relics of an earlier age, equipped with obsolete guns. In this and in sundry other directions the force met with less encouragement than its keenness deserved. Although reports from successive Superintendents of Naval Reserves testified to the fine spirit and high standard of professional efficiency exhibited by officers and men, it was not until 1904 that the former were able to rise above the rank of lieutenant, while the men's uniform was not assimilated to that of the Royal Navy until the 'nineties, when a free kit was granted.

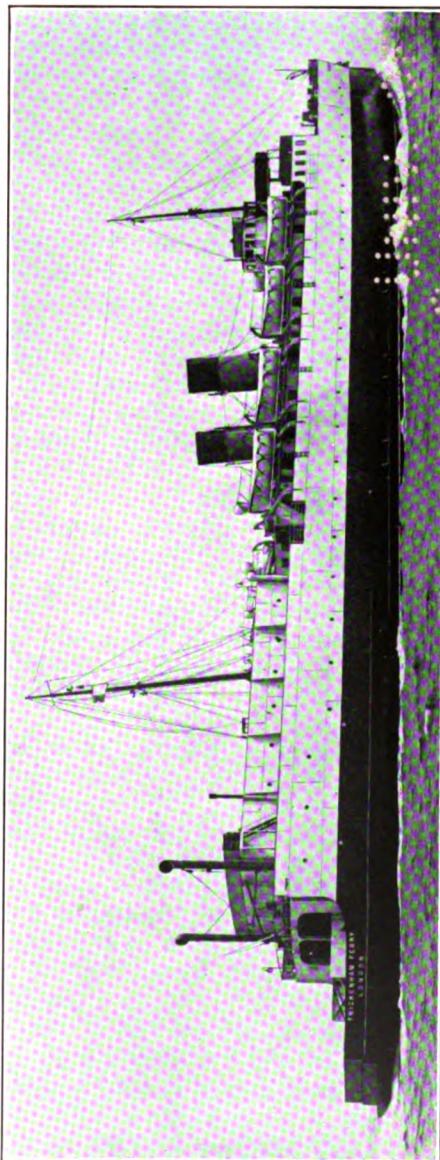
July, 1867, was an outstanding date for Royal Naval Reservists, 1,200 officers and men being embarked in the Fleet for a royal review at Spithead. By this time the effective strength of the force had grown to 17,000. Further encouragement came two years later, when 12 officers and 1,700 ratings were taken to sea for a fortnight's cruise, forming part of the complements of the heterogeneous collection of ships forming the Reserve Squadron under Rear-Admiral Cooper-Key. There were eleven ships in the squadron, of which the flagship Agincourt, the Hector and the Valiant were the only ironclads.

An untiring friend of the Royal Naval Reserve, especially in its struggling early days, was the founder of this "Annual." From



THE FORTH DIESEL-ELECTRIC FERRY-BOAT QUEEN MARGARET.

(*Builders, Messrs. William Denny and Bros., Dumbarton.*)



THE SOUTHERN RAILWAY'S TRAIN FERRY TWICKENHAM FERRY.

(*Builders, Messrs. Scott, Hunter and Wigham Richardson, Wallsend-on-Tyne.*)

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Lord Brassey's fertile brain there were constantly emerging fresh schemes for improving the force and extending its scope. In the early 'seventies, when its strength had declined to about 12,000, he was particularly active in bringing forward proposals for its expansion. He was not slow to criticise the antiquated weapons of the drillships. As a result, new drill stations were provided in 1874, with slightly less ancient guns, and so situated that men might not have to travel long distances to undergo training. At the close of the same year a flag officer was for the first time appointed to superintend the Reserves.

A fresh opening was provided for R.N.R. ratings in the Arctic Expedition of 1875-76, all six of the experienced ice quartermasters selected from the whaling fleets belonging to the Reserve. Moreover, the yacht Pandora, which acted as liaison ship between the expedition and England, was commanded by Lieutenant (afterwards Sir Allen) Young, R.N.R., a polar veteran who had accompanied McClure in his search for Franklin in the 'fifties. That this good service was not unrecognised in the highest quarters became evident in 1877, when the Prince of Wales (King Edward VII) consented to become an honorary captain, R.N.R. Two years later another Royal connection was formed, the Duke of Edinburgh being appointed Admiral Superintendent of Naval Reserves. His term of office, which occupied three years, was notable for his advocacy of an increase in the amount of sea training given to reservists.

Though the Duke of Clarence held the successive ranks of honorary sub-lieutenant and lieutenant from 1883 until his death in 1892, there was no other Royal appointment to the R.N.R. until 1920, when the Duke of Connaught became an honorary captain.

During the 'seventies a number of the Mercantile Marine training ships for boys were induced to become feeders to the R.N.R. Guns and a gunnery instructor were supplied to each ship, and a grant of £3 was made for every boy accepted for service in the R.N.R. as a result of the gun drill imparted. A little later additional facilities, in the shape of gunnery instructors, were extended to the mercantile cadet ships Conway and Worcester. Since 1872 the Admiralty had selected a number of cadets from these ships every year for appointment as midshipmen, R.N.R., but in spite of this there was still a decided shortage of officers.

In 1882 the good work done by the Registrars and Deputy Registrars of Royal Naval Reserve was recognised by the conferment on a number of these hardworking officials of honorary rank as Paymaster or Assistant Paymaster, R.N.R., according to their length of service. This rank ceased to be honorary at the close of the century, when provision was made for advancement to staff paymaster.

In 1885 war with Russia was so narrowly averted that attention was concentrated on various imperfections in the organisation of the Fleet and its reserves. To remedy the shortage of cruisers a number of liners were armed and commissioned temporarily. During the short time they were in service these auxiliaries are

reckoned to have cost the country at least a million sterling. As a result of the complications which arose in connection with the pay of R.N.R. officers appointed to these armed merchant cruisers, a new Order in Council was issued which regularised rank, pay, and allowances. Arrangements were also made with several of the principal shipping companies for an increased proportion of reservists to be included in the crews of their faster vessels. Ten R.N.R. officers were appointed to H.M. ships in order that they might participate in the manoeuvres which succeeded the termination of the war scare, this being the first instance of such appointments since the 1869 experiment, already mentioned. In 1886 eight officers were embarked, while new regulations were framed to permit of R.N.R. officers volunteering for temporary service in the Royal Navy. Definite agreements were entered into with the P. & O., Cunard, and White Star Lines for certain of their ships to be largely manned by R.N.R. personnel and to be held at the disposal of the Admiralty in the event of war, in return for annual subventions.

It was not until 1887 that the disparity in age between R.N.R. officers and those of corresponding rank in the Royal Navy was recognised by the conferment of acting rank as lieutenant upon sub-lieutenants, R.N.R., embarked for training afloat with the Fleet. This was a great boon, since it enabled the officers affected to mess in the wardroom instead of in the gunroom. It had much to do with a noticeable increase in the number of applications for R.N.R. commissions which followed, bringing the total of officers on the active list up to nearly 400.

At the end of the 'eighties it was decided that signalling was a subject in which R.N.R. ratings should become proficient. It is scarcely necessary to emphasise the soundness of this decision, which has led by degrees to the high standard of efficiency with which merchantmen are now able to converse with warships whenever they meet at sea.

Early in the 'nineties provision was made for R.N.R. officers to undergo short courses of instruction in gunnery at the naval ports. Increased rates of pay were granted to R.N.R. engineer officers, with the desired effect of remedying the shortage which had up to then existed in that branch. At the same time arrangements for mobilisation were overhauled and improved. But as it was felt that there were directions in which the efficiency of the force still left room for improvement, a committee of inquiry was appointed under the presidency of Vice-Admiral Sir George Tryon, who had held the post of Admiral Superintendent of Naval Reserves for nearly three years. Recommendations made by this body which were ultimately carried into effect included :

**An increase in the establishment of officers.**

The institution of a retired list of the R.N.R., on which officers might rise to the rank of commander, or even captain.

Extension of facilities for sea training.

Improvement of drill facilities and equipment.

Stakehold ratings to undergo training in warships.

Most important of all from the recruiting point of view, a free kit was sanctioned. Uniform was made almost identical with that of the Royal Navy, all difference finally disappearing in 1898. A welcome increase in the volume of entries of both officers and men was the immediate effect of these reforms.

Though R.N.R. ratings were invited to volunteer for service afloat in the 1891 manœuvres, this innovation was not repeated in the following year, despite the difficulty experienced in manning the additional ships then commissioned. In 1893 a large proportion of the R.N. Reservists embarked in the Fleet were Irish fishermen. Entirely devoid of big-ship experience, they failed to give satisfaction. Their only training had been in outlying drill batteries with guns of obsolete type. Though the latter disability gradually disappeared, men of this class were still being adversely reported on twelve years afterwards. Captain W. H. Parker, R.N.R., who in 1905 was in charge of several parties of Irishmen under training in H.M.S. *Æolus*, gives an emphatic description of their incapacity :

They were not sailors, nor even seagoing fishermen, but merely longshore peasantry, who sometimes fished from a boat. It was the general opinion of all who had to instruct them that several per cent. were mentally deficient. There was always a batch at the end of the training period who failed in everything except boat pulling.

Doubt was at times cast on the value of genuine seagoing fishermen as Reservists ; but the Great War proved that there was ample scope for their services in the many auxiliary craft engaged in minesweeping, patrol work, etc.

A special sum was set aside in the Navy Estimates for 1894 to give 700 men of the R.N.R. six months' training with the Fleet, as new ships were being commissioned at a rate which had outstripped naval recruiting. To remedy the corresponding shortage of officers, the celebrated Supplementary List of Lieutenants and Sub-Lieutenants, R.N., was opened in 1895, for the benefit of R.N.R. officers desiring to transfer to the regular service. The first batch of entries, known unofficially as "The Hungry Hundred," was supplemented in 1898 by a second, dubbed "The Famishing Fifty." A third contingent, entered in 1913, has sometimes been called "The Starving Sixty." Though not intended to be offensive, it is to be feared that these nicknames were resented by the officers concerned, whose professional attainments were of a high order and whose patriotism could not be denied. Undoubtedly some, disappointed in any early opportunity of attaining higher rank, became soured ; but the majority pulled their weight and became a distinct asset to the service. Most important of all, their presence in wardrooms provided the Navy with an excellent sample of the quality of the R.N.R.

At the Diamond Jubilee review of 1897 and the manœuvres that followed, no fewer than 772 R.N. Reservists were embarked, and by the turn of the century the strength of the force exceeded 26,000. In 1902 a new class of accountant officers was established, drawn from the staffs of banks and business firms. In that year the total number of officers borne was 1900, comprising 482

lieutenants, 494 sub-lieutenants, 524 midshipmen, and 400 engineer officers. There was also another healthy sign in the shape of a "waiting list" of 433. In 1903 it was decided to enter a number of warrant engineers, for which there had previously been no provision. The long-sought rank of commander on the active list came into existence a year later.

Training was reorganised in 1906, the stationary drillships being reduced in number to four, at London, Bristol, Liverpool, and Aberdeen, and the batteries to seven, with a sentence of abolition in another five years. Men were required to do three months' training afloat in their first year of service and one month every alternate year afterwards. Advancement of a limited number to leading seaman or leading stoker was granted.

In 1909 the R.N.R. officers' decoration (R.D.), for long and meritorious service, was instituted. It is still a legitimate grievance that this much appreciated honour should stand so low in the official order of precedence. It actually ranks after the police medal.

In the years immediately preceding the War, a special Trawler Section of the R.N.R., with its own distinct uniform, was formed from the fishing fleets. It had a single rank, Skipper, R.N.R., to which was later added that of Chief Skipper. Ratings were second hand, deck hand, engineman, and trimmer. Specially trained for minesweeping duties, this branch of the R.N.R. proved invaluable during the War.

In 1912 power was given to the Admiralty to grant temporary R.N.R. commissions, of which full advantage was taken in 1914-18. Courses in strategy and international and prize law were opened to R.N.R. officers desiring to study these subjects. Accountant officers were permitted to go to sea for training during manœuvres to gain familiarity with sea conditions. A number of liners were equipped with a pair of 4·7-inch guns, to be mounted aft for defensive purposes, and fought by R.N.R. personnel. In June, 1914, the rank of captain on the active list was created.

At the end of July, 1914, the strength of the force was 16,355, including 1,025 belonging to the Trawler Section. Although lower than that reached some years earlier, this figure represented a far higher average of efficiency.

#### THE TEST OF WAR.

It was soon found that the demand for officers in small craft far exceeded the numbers that could be provided by the R.N.R. permanent establishment. Of the many temporary officers entered, comparatively few had had any service experience; but these included over twenty retired flag officers with temporary commissions as Captains, R.N.R. There were also at least as many other temporary R.N.R. officers who had previously held commissions or appointments in the Royal Navy, R.I.M., R.N.R., or R.N.V.R.

Sir Richard Williams-Bulkeley, Bt., who held the honorary

rank of Captain, R.N.R., and had at different times been in command of the Liverpool Brigade of the R.N.A.V. and the Mersey Division of the R.N.V.R., was given the new rank of Commodore, R.N.R., when placed in charge of the R.N. Depot at the Crystal Palace. Others who in due course became Commodores included Captain H. J. Haddock, R.N.R., of the Special Service Squadron, and Sir Frederic Young, the Head of the Admiralty Salvage Section, besides certain of the retired flag officers mentioned above.

In round figures, the maximum numbers borne during the War amounted to 9,700 R.N.R. officers, 8,100 skippers, 17,600 men for general service and 36,000 in the Trawler Section; 941 officers and 5,452 men lost their lives in their country's service, while 2,606 officers and 2,708 men were decorated. A few R.N.R. officers were transferred to the Royal Navy for distinguished service. These were not placed on the Supplementary List, but allowed to rank with the general body of naval officers. Very few supplementary officers ever got beyond the substantive rank of lieutenant-commander on the active list, though one (Sir Guy Gaunt) became an Admiral.

Many of the older warships, and notably the ships of the 7th and 10th Cruiser Squadrons, were mainly manned by R.N.R. personnel. In the disaster to the Aboukir, Cressy, and Hogue, over 1,000 R.N. Reservists were lost. In fact, before the end of the War there was not a single theatre of naval activity in which the Royal Naval Reserve was not represented. It would be easy to fill a considerable volume with records of the excellent services rendered. Apart from such celebrated combats as those between the Carmania and the Cap Trafalgar, and between the Alcantara and Greif, there were not a few gallant actions fought by R.N.R. officers and men of which too little has been heard. Such was the amazing fight made by Lieut. A. Bisset Smith, R.N.R., master of the s.s. Otaki, against the German raider Möwe. Hopelessly out-matched, he refused to surrender, and went down fighting after setting his adversary on fire and inflicting fifteen casualties. When it is added that the Otaki mounted only a single 4·7-inch gun astern, compared with four 6-inch, one 4·1-inch and two 22-pounders in the Möwe, it will be agreed that Lieut. Bisset Smith's posthumous V.C. was worthily bestowed.

Of similar character was the brief conflict between the armed boarding steamer Ramsey and the German minelayer Meteor. Surprised by the sudden unmasking of a disguised armament much more powerful than her own, the Ramsey was sunk with colours flying. Her captain, Lieut.-Commander Raby, R.N.R., and those with him on the bridge, were killed by the enemy's first discharge.

Far too little has been made of the Trawler Section, whose task of sweeping up enemy minefields was never-ending. They had to face not only the danger incidental to this duty, but also the risk of sudden onslaught by a better-armed foe. In May, 1917, a typical instance of this was furnished in the Otranto Barrage patrol. Attacked by Austrian cruisers and destroyers, thirteen drifters out of thirty-eight were sunk, but not without resistance.

Skipper Watt, of the Gowan Lea, blazed away at the enemy with his tiny gun until it was disabled and the drifter badly damaged.

Anti-submarine operations owed much to the R.N.R., by whom the sloops, trawlers, P-boats, and other craft so engaged were largely manned. By the end of the War there were many R.N.R. officers in command of vessels engaged in this work. As navigators of submarines, R.N.R. officers were particularly successful. In "Q" ships the R.N.R. were always to the fore, their mercantile experience being invaluable in lending verisimilitude to the disguise of a decoy vessel. Stuart, Bonner, and Auten are names of V.C.'s which spring to the memory in this connection.

Insufficient use was made in the earlier stages of the War of the experience of the senior R.N.R. officers, many of whom remained at their pre-War posts in command of big liners, etc. But in 1917-18 some of them proved their worth as Commodores of convoys.

Newfoundland R.N.R. ratings, who would have made a poor showing when confronted with the routine of a battleship, came to the fore in the 10th Cruiser Squadron, in which each ship carried a proportion of these men. Accustomed to working small boats in the heavy seas off the Grand Banks, these men were indispensable as boats' crews when ships had to be stopped for examination in all weathers. Moreover, it was impossible to tire them out when boat pulling; they used a short stroke quite different from the Navy one, but it was always effective. Australian, New Zealand, and Canadian R.N.R. personnel also did their share in the War.

It was considered unfair by certain R.N.R. officers that they should be superseded in command of their own ships by naval captains when these vessels were commissioned under the White Ensign. Their contention was that their services were not being used to the best advantage, since the original captain of one of these ships, having been in command for a considerable period, ought to be in a position to handle her more effectively than a newly appointed naval captain without previous experience of merchant vessels.

So far as the 10th Cruiser Squadron was concerned, it was stated by the Admiral commanding that naval officers, being used to working in a squadron, were better fitted to command the ships and respond to signals from the flag, leaving the responsibility of navigating to the former captain. In practice there seems to have been no trouble, as, once their relative positions had been established, the R.N.R. second-in-command invariably supported his captain loyally.

#### RELATIONS WITH THE ROYAL NAVY.

This seems a fitting point at which to refer to the whole question of relations between R.N.R. and R.N. officers. There is no doubt that in the early days of the Reserve, misunderstanding and mistrust were rife. With the War and its more intimate contacts, each service acquired a better knowledge of the other, with a

resultant growth of mutual respect. To-day a civilian observer in naval wardrooms could not fail to be impressed with the excellent relations invariably existing between the naval officer and his R.N.R. confrère. They go ashore together, play games together, and quickly get to know each other's point of view. In a future war there should be far more sympathy between regular and reserve personnel.

In a book recently published by Commander R. L. Dearden, R.N.,\* who entered the Navy as a supplementary lieutenant from the R.N.R. in 1913, the causes of this friction are laid bare. Himself the son of a naval officer, Commander Dearden appears to have been peculiarly susceptible to slighting remarks from shore folk, who deplored his having joined the Merchant Service instead of the Navy. Probably many a naval officer received a similar impression of civilian views. To quote Commander Dearden,

The pre-war naval officer looked on us with thinly veiled hostility. He always assumed we had joined the R.N.R. with some idea of social betterment. We on our side tended to develop an "inferiority complex."

During my time as an R.N.R. officer I received more snubs, more gratuitous rudeness, less encouragement and fellowship than during any period of my life.

This is a very different picture from what is to be found to-day, but it is as well that it should be presented for comparison.

In Commander Dearden's case he appears to have "lived down" his first disappointment, as his subsequent transfer to the Navy attests; but some R.N.R. officers seem never to have been able to work very cheerfully with the Navy. Captain S. G. S. McNeil, R.N.R., gives a decidedly unhappy impression in this connection. In his book † he asserts that :

In certain spheres of sea operations, senior R.N.R. officers, especially commanders and lieutenant-commanders, were just tolerated. This attitude continued to the end of 1917. It was the cause of much bitterness and friction.

I have met more than one naval officer who was unfit to be in a position of command, on account not only of his despotism, but also of his illogical prejudice against the R.N.R.

Captain Sir Arthur Rostron, R.N.R., in "Home from the Sea," ‡ is by no means so bitter in his remarks. He appears to have preserved a better balance in his contacts with naval officers who were "difficult," though he observes : "The Navy did not appreciate the value of the mercantile marine until the war had been in progress a considerable time." He also complains that insufficient use was made of the services of senior R.N.R. officers. He thinks these would have been well employed as naval transport officers instead of the "dug-out" naval officers who usually got these appointments.

Captain Sir Bertram Hayes, R.N.R., who drilled as a sub-lieutenant in H.M.S. Eagle with iron muzzle-loading guns, trained by means of tackles, never went to sea for twelve months in one of H.M. ships, because "The impression I got from those who had

\* "Watch on Deck," Blackie & Son, Ltd.

† "In Great Waters," Faber and Faber.

‡ Cassell & Co., Ltd.

was that they had a very good time, but did not learn very much." \* This hardly suggests a frigid reception of R.N.R. officers in the average wardroom. Nor is there the least suggestion of such a thing in Captain W. H. Parker's "Leaves from an Unwritten Log Book," † though he served afloat in the Royal Navy for between two and three years, including the war in China, 1900. He remarks that his captain "gave him a lot of sound advice" on joining, while at the conclusion of his sea training period he sums up his experience thus : "A very happy interlude in my sea career. I look back with feelings akin to affection for all my old shipmates."

Probably much of the trouble originated through the practice of sending R.N.R. officers to sea at an age when they had become set in their ways, a fact which is indicated by Commander Crutchley, R.N.R., in "My Life at Sea" ‡ :

It is one thing to be a R.N.R. officer in command of a fine [merchant] ship, but it is quite another matter to give up separate command and take your place as one of the units.

For a man to become a satisfactory Reserve officer, it is necessary he should get his experience as early as possible. It is a matter for satisfaction that this has now been recognised.

At the same time he declares : "In all my periods of drill service I had always been shown a great deal of consideration."

Enough has now been said on this subject, but being one of which far too much was heard before and during the War, it is well that the causes of friction should be discussed.

#### THE R.N.R. TO-DAY.

In November, 1934, the active strength of the Royal Naval Reserve comprised 1,048 executive officers, 74 engineer officers, 200 accountant officers, and 239 skippers, with a lower deck personnel totalling 8,040. The latter figure was made up of 4,906 seamen, 460 engineroom artificers, and 300 stokers, for general service ; 1,544 seamen, 397 stokers, and 433 enginemen, for the patrol service.

Training requirements for executive officers are : three to four months on entry, according to rank, followed by twenty-eight days biennially or triennially, this again varying with rank. Nine months' sea training has to be performed once during an officer's career. Other branches undertake similar obligations on a reduced scale. Seamen do forty-two days' training on entry, and twenty-eight days or less every two years, according to length of service. Other branches' training periods are in the same proportion on a smaller scale. Of late the numbers embarked for training have been in excess of the above requirements. Thus, in 1932 there were embarked about 44 per cent. of the officers on the active list, and in 1933 about 41 per cent. In both years the percentage of men going to sea for training was between 38 and 39 per cent.

\* "Hull Down," Cassell & Co., Ltd.

† Sampson Low, Marston & Co., Ltd.

‡ Wm. Collins, Sons & Co., Ltd.

A short air course is now included as part of the nine months' obligatory training referred to in the preceding paragraph. Officers so qualified should be a decided asset to the Fleet Air Arm in time of war, trained observers with expert knowledge of merchant shipping being scarce.

Such training should also be of value to R.N.R. officers in the Merchant Navy. Aircraft escorts for convoys are not a novelty. Moreover, several transatlantic liners are now equipped with aircraft for landing mails in advance of their arrival. For a junior officer to be qualified to pilot the aeroplane attached to his ship will sooner or later become the recognised thing.

Immediately before the War several R.N.R. officers went to the trouble of gaining flying experience. Some ultimately joined the R.N.A.S., and were in due course transferred to the R.A.F. Instances of this are the present Air Vice-Marshal Bowhill and Air Commodores Bigsworth and Welsh. Others, after a certain amount of flying service, reverted to R.N.R. duties; one of these, Commander R. H. Walley, R.N.R., is still on the active list to-day.

One of the most valuable features of the present organisation of the Naval Reserve Office is the R.N.R. Advisory Committee. Its functions are to assist the Admiral Commanding on general questions affecting the R.N.R. and, through it, the Merchant Navy. Members of the Committee are appointed by the Admiralty on the advice of the Admiral Commanding, and the membership is large enough to enable the Admiral always to have available a sufficient number to advise on any question that may arise in connection with the R.N.R. Another function of the Committee is to provide the R.N.R. with a suitable body through which to submit legitimate aspirations, or to put forward suggestions for improving the efficiency and welfare of the R.N.R. It also acts as a medium through which shipowners can approach the Admiralty on R.N.R. affairs. At present the composition of the Committee is as follows:

- (1) The Admiral Commanding (at present Vice-Admiral G. K. Chetwode, C.B., C.B.E.), as Chairman, assisted by any of his staff as necessary.
- (2) The Registrar-General of Shipping and Seamen, and/or his representative.
- (3) Representatives of Shipowners' Associations (three in number at present).
- (4) Representative senior R.N.R. officers (at present four captains, an engineer and an accountant officer, a chief skipper and a representative of the Marine Engineers' Institute).
- (5) A Secretary (at present Paymaster Lieut.-Commander M. A. W. Sweny, R.N.).

It is laid down officially that the existence of this Committee does not prohibit members of the R.N.R. from approaching the Admiral Commanding direct. Any R.N.R. officer may call without appointment at the Department, which is in Queen Anne's Chambers, Tothill Street, Westminster, close to St. James's Park Station.

In conversation with R.N.R. officers it is difficult to trace any general trend of opinion on the working of the organisation in its present form. All seem to agree that conditions are better than they have ever been. But it is urged by some that instructional courses are needlessly burdened with details, many of which are superseded in a very short time. Especially is this the case in regard to gunnery, new devices being responsible for frequent

changes in drill. In lieu of so much technical detail, R.N.R. officers would value more training in the art of handling bodies of men.

At present young R.N.R. officers are given much of their sea training in big ships. It is considered by many of them that more time should be spent in small craft, especially destroyers, where it is easier to form the habit of quick decision, a valuable quality in a navigator. To some extent this can be acquired by occasional spells in charge of a drifter attached to a battleship or battle cruiser, but it is not quite the same thing.

Protests are occasionally made against the compulsory retirement of R.N.R. officers on their taking up shore appointments of a marine character, such as the post of harbour-master. That in time of war their knowledge and experience would be of great value is indisputable, but their retention would slow up promotion. Officially it appears to be felt that, in view of the limited funds available, every effort should be made to exclude from the active list of the R.N.R. executive branch any one who is not still serving at sea. Undoubtedly there would be no difficulty, if a further £100,000 or so per annum were readily available, in doubling the present strength of the Reserve, so bringing it up to the pre-War establishment. As it is, there is always a "waiting list." A suggested means of retaining the services of R.N.R. officers who would otherwise be retired on taking up shore appointments is the institution of a "List II," similar to that existing for R.N.V.R. officers.

An economy recently suggested is the reduction of the accountant branch of the R.N.R. to its original composition, so as to include only the Registrar class, the money thus saved being devoted to increasing the numbers of the executive officers. It is argued that any shortage of accountant officers would soon be made up by the expansion of the R.N.V.R. accountant branch without expense, since R.N.V.R. accountant officers do not receive the £25 annual retainer paid to their opposite numbers of the R.N.R. But it must be borne in mind that many of the present R.N.R. accountant officers are pursers, whose shipping experience alone is well worth the retaining fee.

There is a school which holds that the whole of the British Mercantile Marine should be organised as part of the Royal Naval Reserve, thus becoming a State service. This would presumably involve State payment of the personnel, the financial burden of which it would be difficult to estimate exactly. During the War a step was taken in this direction, a Mercantile Marine Reserve being formed to furnish crews for the guns of defensively armed merchant vessels. Those who had the training of these men found them highly intelligent and easy to teach.

Much more might be written did space permit; but sufficient has been said to show that the Royal Naval Reserve to-day is giving good value for the comparatively small sum which it costs annually. Its efficiency is high and its spirit is excellent. Should war come, there is no doubt it would acquit itself in a manner worthy of the great traditions of the Navy.

FRANCIS E. MCMURTRIE.

## AIR SECTION.



## CHAPTER XII.

### THE FLEET AIR ARM.

A DECADE has now passed since the creation of the Fleet Air Arm. The history of its development during these years shows that progress has been sustained in technique rather than in numbers. There has been no evidence of haste to reach a level of strength comparable with that of the other principal foreign naval Powers. But the omission has, *ipso facto*, permitted a greater deliberation in the choice of aircraft type and design, and in the development of ship equipment connected with the launching, flying off, and deck-landing of aeroplanes than would in all probability have been possible otherwise.

During the course of 1934, a general change in the policy of the Government with regard to our national defences has been made evident. Expectations of disarmament by foreign Powers, in harmony with that of Great Britain, having been disappointed, a claim upon public interest in the national safety has been made on behalf of our air defences. Although no specific mention was made of the Fleet Air Arm in the general announcement made by Mr. Baldwin in July last on the Government's new air defence policy,\* a significant contribution towards the Navy's deficiency in air strength has been included in the 41 squadrons to be added to the Royal Air Force. It is intended that  $\frac{3}{4}$  of those squadrons are to go to the Fleet Air Arm.

#### DEFICIENCIES.

As in the case of all arms of the fighting services, there are two standards by which strength may be assessed. The first is by the comparative standard—the ship-for-ship, or plane-for-plane comparison between the British forces and those of a potential enemy. The other is by the absolute standard, *i.e.*, one based on minimum requirements.

In respect of the number of ships required, the absolute standard is a difficult one to apply. In respect of ship-borne aircraft, however, the problem is much simpler, given a fleet of already determined strength, because aircraft have now become a finite item of fleet equipment. The scale of air strength for a given fleet is a mathematical factor.

It is an unfortunate fact that during the last ten years, by either of these standards, British naval air strength has fallen to a very low point. By comparison with that of foreign naval Powers, it is

\* House of Commons, July 19, 1934.

overwhelmingly out-numbered, and the unfavourable ratio is growing every year. By an assessment of "absolute" ship-by-ship requirements it is also lamentably in default.

These deficiencies may be shown in detail under these categories :—

- (a) Shortage in the aircraft carriers.
- (b) Lack of all or part of the equipment which would normally be carried in our existing capital ships and cruisers.
- (c) Those further numbers for the operation of our present fleet, which cannot be embarked before the older cruisers are replaced by more modern types.

A careful analysis of our present Fleet would indicate that under these headings the Fleet Air Arm is shown to be at barely half its proper strength. Official information shows that there are at present 182 carrier-borne and 27 catapult-ship aircraft now in service. This year's estimates provide for a further 6 in each category. Ten capital ships still carry no aircraft at all, and the remainder but 1 apiece. Of the 49 cruisers now in commission, 2 only, the Exeter and the Achilles, are provided with 2 aircraft each, 18 have 1 and the remainder are not equipped. These numbers should be compared to the 2, 3, and 4 seaplanes regularly embarked in the battleships and cruisers of our Japanese and American contemporaries.

A detailed assessment of carrier deficiencies is more difficult to arrive at. No naval Power is willing at the present time to divulge the full working capacity of its carriers. But some inferences may here be drawn from the fact that 48 have on occasion been embarked by a single carrier in our Fleet, while the present complements of Courageous, Glorious, and Furious are shown as 42, 36, and 33 respectively. The Eagle, smaller in capacity than these three, has a complement of but 21, which may be assumed to be the largest number which she could satisfactorily operate. For the Hermes and Argus, no special provision of aircraft is at present authorised.

The decision to make good these deficiencies in the Fleet during the next five years, simultaneously with large developments in our home-based air defence forces, has led many people to believe that the Fleet Air Arm is an integral part of our air defence organisation rather than an integral part of the Fleet. The intended increase is none the less a very welcome decision and one which has long been waited for by all naval officers. Let us hope that this step will lead to the ultimate provision of an adequate and permanent quota of aircraft in the Fleet, the need for which has long been realised by those who have studied the technique of modern naval warfare and its bearing upon our vital food supplies.

We should have no illusions in the matter of providing equipment and training to meet this need. War comes swiftly, and the ships abroad cannot be brought home for fresh personnel and equipment at the eleventh hour. Absence from their stations of any ships, even for a short period, would cause the gravest possible danger to our sea communications. They must be properly equipped at all times in peace, and even the ships nearer at home

must have their full equipment and trained personnel ready at a moment's notice. Moreover, if the air units of our Fleet are to go into action with a technique at least as good as that of the enemy, they must have continuous training with the Fleet. For this reason, the country should welcome any permanent additions to the Fleet Air Arm.

#### MANNING AND CONDITIONS OF SERVICE.

In a former edition (1931) of "Brassey's Annual" a chapter was largely devoted to the relation of events and the deliberations of the Government directly connected with the birth of the Fleet Air Arm as we know it to-day. The provision of personnel for this service from both officers and men of the Royal Navy as well as from the Royal Air Force was the direct result of their final settlement by the Trenchard-Keyes agreement in 1924. It may be convenient to summarise very briefly the history of those events in order that the reader may be reminded how the present composition and dual administration of the Fleet Air Arm came about.

"Aeronautics" were first officially studied by an advisory committee (1909–11) on which the Admiralty and the War Office were represented. A general divergence of naval and military requirements then became recognised and led to the formation of the Royal Flying Corps with a Naval Wing and a Military Wing of which in July, 1914, the former became the Royal Naval Air Service. By the beginning of 1918, the Admiralty were administering no less than 2,800 aircraft and 55,000 officers and men belonging to the latter Service. The War Office had assumed a correspondingly large responsibility. In many respects, notably initial flying training and the supply of certain material, there was a large amount of harmful duplication of effort and competition for contract. The establishment of the Air Ministry, and the embodiment of the flying services of both the Army and Navy in the Royal Air Force, established on April 1, 1918, were the direct outcome of these evils.

It is to be noted, however, that whereas during the War great strides were made in the technique and employment of air forces for military or land warfare, and for the new science of attacking civil objectives by air, progress in the employment of aircraft for naval purposes was very much retarded because no practical kind of aircraft-carrier had, up to that period, been developed.

Consequently, very little, if any, real use was made of aircraft in fleet tactics, and the R.N.A.S. and (later) R.A.F. units working under naval orders were largely employed on reconnaissance duties, and based at shore stations on the coast. The few fighter aircraft carried on the turret platforms of our heavy ships could never have been employed for either reconnaissance or "striking" purposes against enemy ships. Their assigned function was to defend against air attacks.

In the four years immediately following the War, great developments were made in aircraft-carrier design, and the technique of

practical deck-landing quickly followed. As a direct result, new types of aircraft suitable for deck-landing reconnaissance, and carrying torpedoes, came into being. Thereupon the situation which had led to uniformity in air effort automatically changed.

The duty of aircraft with the Fleet was no longer confined to flying from the deck of a ship to combat enemy attacks by air. It now involved the use of weapons with which to anticipate or reinforce attack by the gun or the ship-borne torpedo. Those directing these attacks must have a consummate knowledge of naval tactics and the use of the gun, in order that their effect should be properly concerted and not be wastefully haphazard. The pilots of these newly employed aircraft must also know their special tactical purpose, and besides having a sound knowledge of the functions of all fleet units, they must be intimately familiar with the appearance of all types of ships, and those subtle evidences of their activity which an officer of considerable naval experience alone can appraise. It need hardly be added that no less experience is needed by an observer who has to report all he sees, and also spot the effect of gunfire. To his repertoire very accurate navigation over the sea has also to be added.

During these years of development the supply, administration, and executive control in all matters of naval aviation, except ship design and the direction of operations, still rested with the Air Ministry. In 1924 the Admiralty, having strongly represented that this anomalous state of affairs was most adverse to the proper conduct of their assigned function, were granted a somewhat greater measure of control in naval air questions, and a maximum quota (70 per cent.) of naval officers were permitted to hold commissions in that part of the R.A.F. known as the Fleet Air Arm. This is the point at which the F.A.A. administration, with a few minor adjustments, has been established during the last ten years. Material and operations have made even more progress since than before 1924. As will be described in the latter parts of this chapter, the aircraft themselves have now become specialised for naval work to a greater extent than ever, and the time has definitely been reached when land aircraft can no longer be operated at sea.

Ten years of progress in the tactical use of naval aircraft has, moreover, had a large influence on warship design, as well as on naval operations. The corollary is also true. The older methods of employing aircraft at sea are being replaced by newer ones evolved by the naval staffs who can, now that a very wide infusion of flying experience into the Navy has taken place, appreciate all aspects of naval air problems. In such problems the Navy is now fully competent.

Besides these purely objective considerations, other questions of great importance rest upon the administrative fabric of the Fleet Air Arm. These other questions, namely, personnel and estimates, have important reactions on the whole British Fleet. Not only is a high proportion of the cost now borne by Navy Votes devoted to this new adjunct to the Fleet, but also a large percentage of naval officers in the more senior, as well as the junior, ranks will

before long have done much of their service in Fleet Air Arm appointments. It is a matter of congratulation to both the Navy and the Air Force that the scheme of tuition and development embarked upon under the recommendations of the Balfour Committee (1924) has achieved so much during these ten years.

There have, of course, been many problems of administration for both Services in maintaining the dual nature of the Fleet Air Arm, and amongst them has been the need of an equitable arrangement for adjusting the Royal Air Force rank of naval pilots so that it conforms more closely with their naval seniority, and for establishing the status of the naval officers who, as observers, hold no R.A.F. rank at all.

In 1932 a further agreement was made between the Admiralty and the Air Ministry upon this question of the naval pilots' promotion in R.A.F. rank, and the agreement was also extended to include other conditions of their service. By virtue of that arrangement, the following conditions now hold.

When qualified as pilots, naval and marine flying officers are eligible for promotion in R.A.F. rank (while in zones of their naval or marine seniority) as follows :—

Naval Rank.	Eligible for Promotion to :	Zone.
Lieutenant, R.N. . .	Flight-Lieut., R.A.F. . .	3½-5½ years as Lieut., R.N.
R.M. . .	" "	5-7 "
Lieut.-Commdr., R.N. .	Squadron Leader, R.A.F. .	2½-4½ years as Lieut.-Commdr.
Captain, R.M. . .	" "	3-5 " Captain, R.M.
Commander, R.N. . .	Wing-Commander, R.A.F. .	After 2 years as Commander.

Majors, R.M., will also be eligible to hold the rank of Wing-Commander, R.A.F. R.N. and R.M. Flying Officers who do not reach the R.A.F. rank of Flight-Lieutenant on passing out of their respective zones, have automatically to relinquish their R.A.F. commissions and cease their flying duties.

The new arrangement also affects the period done in general service, which is now of two consecutive years' duration, and does not begin until about five years' flying have been completed. It consequently will only apply to those who have been promoted to Flight-Lieutenant.

The standard of efficiency of naval pilots is now very high, and improvements in the technique of flying on and off carriers have resulted in more practice than before being possible under adverse conditions of weather.

Half of the F.A.A. squadrons are now commanded by naval officers. These officers have all spent many years in the specialised flying duties required for the Fleet, and in this respect they may gain more experience than their contemporaries in the Air Force whose visits for service in the Fleet Air Arm are only intermittent.

No recent changes have been made in the organisation for providing and training observers. The general introduction of multi-purpose aircraft into the F.A.A., of which particulars are given later, has led to a far greater demand than hitherto for observers. The demand for pilots has also, of course, increased for the same reason. The crowded wardrooms of our aircraft-carriers

already illustrate what a generous proportion of officers this service now carries.

In the Air Force it has for some time been realised that a more rational proportion of officers to men can be reached by training non-commissioned officers to fly. A few of these sergeant pilots are, in fact, at present serving in aircraft-carriers. The Air Ministry have now gone even farther, and introduced the rating observer, who will be trained in air navigation and in other branches of the land observers' technique. He will thus be able to relieve the Air Force officer of some of his duties in the air. It would seem likely that a similar scheme might be applied with advantage to the Fleet Air Arm, so that naval ratings as well as airmen could be employed as pilots and observers to reduce the now heavy requirements of officers. The high standard of intellect and professional knowledge which is attained by the naval ratings of to-day should amply justify their being given that responsibility.

#### DEVELOPMENTS IN EQUIPMENT.

Aircraft used in the Fleet Air Arm tend to become more highly specialised year by year, and they are now heavier than the corresponding types used for land purposes. The particular arrangements for launching them into flight and recovering them again which are now in use in the Fleet, and for the stresses of seaplane work in rough water, demand special design and strengthening of the airframe structure. In addition to this, they have to be fitted for carrying out long-distance navigation over the sea, for elaborate wireless communication, and for the other functions peculiar to naval tactics which are demanded of these air-borne units. Furthermore, on account of wireless and navigation, Fleet Air Arm aircraft, as a rule, carry one more in their crew than the corresponding land types. These aircraft, moreover, would be at a serious disadvantage if pitted against land-based air forces, because of the big loss of performance both in speed and in range which their extra crew, weight, and equipment involves. Their intrinsic value must be gauged by their performance at their special naval duties.

An important innovation of type was the introduction in 1934 of the torpedo-spotter-reconnaissance aircraft (the Shark). The first machines of this type to be put into production are being supplied by the Blackburn Aeroplane and Motor Company, and it is hoped that a complete squadron will be embarked in a Home Fleet carrier early in 1935. These aircraft will combine the functions of the present torpedo-bomber and the spotter-reconnaissance machines. A gain of great importance is here made in that double the number of aircraft will now be available for either reconnaissance patrols, or torpedo attack, from any given aircraft-carrier.

A second innovation of particular interest is the appearance for trial purposes of a new type of small amphibian flying-boat, the Seagull V. The future value of this type of aircraft to the Fleet has yet to be judged, though it is not considered likely that it will have much offensive power. It may, however, prove to be a most



THE BLACKBURN BAFFIN TORPEDO BOMBER.  
*Bristol "Pegasus" Engine.*



THE BLACKBURN SHARK TORPEDO SPOTTER RECONNAISSANCE AIRCRAFT.  
*Armstrong Siddeley "Tiger" Engine.*  
(By courtesy of the builders. Photos by Doughtys, Ltd., Hull.)

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valuable asset when reconnaissance work has to be carried out from single ships patrolling in the open sea, a function which the ordinary F.A.A. types on seaplane floats are frequently unable to carry out except in unusually calm weather. The faculty possessed by an amphibian will also make this type very useful for many utility services when a fleet is within flying range of an aerodrome.

Except with regard to these more or less experimental Seagulls, the aircraft used for catapulting from capital ships and cruisers are now of the same identical types as those in the carriers ; a simple change from wheels to float under-carriages is all that is necessary for their conversion. Thus, Osprey fighter-reconnaissance and Fairey III F. spotter-reconnaissance machines are now the standard catapult-ship types. Only torpedo-bombers are not yet used in those ships. The appearance of the torpedo-spotter-reconnaissance machine will complete the interchangeability between carrier and ship-borne units. It is possible that the present T.S.R. type will soon be found in all classes of catapult-ship, except the smallest cruisers, where space and weight are a limitation, and consequently only the two-seater type can be accommodated.

Apart from the development of new types of aircraft, a change from water-cooled to air-cooled engines has been found a benefit, particularly in warm latitudes. Thus the Blackburn Ripon and the Fairey III F., which are the standard Fleet T.B. and S.R. machines, are changing their power units, and being renamed the Baffin and Seal respectively. By the beginning of 1935 all the old Fairey Flycatcher fighters will have been replaced by Hawker Ospreys and Nimrods. No new type of fighter is at present being adopted.

Reference has already been made to recent improvements in the operation of aircraft from carriers and other ships. Some information about these new methods is now available for publication, and owing to the valuable results in training, in fleet efficiency, and in economy, which have already been recorded, a brief description of them is given here.

The ordinary principle of "taking off" and deck-landing is, of course, well known. The aircraft carrier proceeds head to wind, so as to produce an even and rapid air-flow straight from bow to stern over the flying deck. The length of run necessary for safe landing and taking off is thus greatly reduced from that required on a land aerodrome with no wind. The high speed formerly necessary in normal or light winds was not only a strain on the machinery and boilers of the ship, but also involved the carrier being taken many miles from her desired course while steaming into the wind. By placing transverse wires at intervals along the carrier's deck, and arranging them to be capable of regulated rendering when under tension, aircraft fitted with suitable hooks can be quickly brought to rest. Such an arrangement allows "landing on" with an air-flow over the deck of much less speed than for ordinary landings. The resulting economy in fuel, gain in life of machinery and boilers, and reduction of the carrier's loss of position with a fleet, are

obvious. Similar gains are achieved by the mounting of a special \* catapult on the carrier's deck, for by this means the aircraft can be flown off in rapid succession at even lower carrier speeds.

One may watch, with no little interest, the advances in working seaplanes in the open sea which are being made by German enterprise in the South Atlantic. The use of a large and specially designed canvas mat, towed astern of a seaplane dépôt ship in mid-ocean, enables a seaplane to land in comparatively rough weather, and be hoisted on board with ease and certainty. After refuelling, she is despatched again by catapult on her transatlantic flight.

Although the apparatus used is at present far too cumbrous and unsuited to a warship's use, the principle may well be a valuable one for the future trade-route cruiser. It is to be hoped that the Admiralty are keeping its possibilities well to the fore, and will keep pace with the progress of our neighbours in these matters. A successful development of this kind should add materially to the effectiveness of our comparatively small supply of cruisers available for trade-route work.

The progress in fitting catapults to the Fleet is well advanced. Some 27 ships are now equipped, and there are few left to be completed. The present policy is to mount one catapult in every capital ship, and in all cruisers of the "Emerald" and later classes. Only one ship, the Exeter, has two catapults, but all the later cruisers will be able to carry a second aircraft in addition to the one ordinarily carried on the catapult.

In respect of numbers of catapults fitted and of aircraft so carried, American policy appears well in advance of our own. Cruisers of the "New Orleans" class, on their recent visits to British naval ports, have displayed a lavish equipment of four complete launching units. The easy stowage of their four Vought Corsair seaplanes, and the snugly mounted cranes, make a striking comparison with our own more cumbrous and less generous arrangements, even in our most modern cruisers of the "Leander" class. But here the unfavourable comparison ceases, for, unit for unit, we have every ground for confidence in our own material, and it is mainly due to considerations other than technical ones that we are numerically so far behind the navies of other Powers.

#### ORGANISATION.

Carrier-borne aircraft units are now all organised on the squadron basis. The change to this from the flight unit basis came into effect during 1933, and has since proved its merit. The reason has been an operational rather than an economic one, although its introduction may have led to slight economies in the non-flying personnel.

Under the former arrangement, collective grouping, for the purpose of air operations, of large numbers of aircraft was not satisfactory because there were no squadron leaders in the F.A.A. unit commands. The organisation was therefore altered to include officers of suitable seniority and experience to lead squadrons in

\* Known as an "Accelerator."

the air. The use of the ripe experience of many of the more senior naval officers who had spent several years in practical Fleet Air Arm work would otherwise have been lost. There are now twelve carrier squadrons in the Fleet Air Arm, and the arrangement with the Air Ministry is that one-half are commanded by naval and one-half by R.A.F. officers. This equal division of the higher posts in the aircraft-carriers also applies to flight-lieutenants. These squadron units are completely self-contained, and when their parent carriers are at their base they are usually disembarked to an Air Force station, for periodical training, overhauls, and leave.

The units of aircraft carried in catapult-ships have also been slightly modified. The former arrangement, by which they were detached from carrier flights, ceased when the squadron organisation came into force. Now each fleet has its own catapult-ship flight or flights, under the command, as a rule, of the pilot of the flagship's aircraft. Consequently, these units vary in size, and they may even be widely distributed geographically. For example, No. 443 Flight consists of 5 Fairey III F.'s, whose distribution is as follows :—

Norfolk . . . .	One III F.	West Indies Station.
Exeter . . . .	Two III F.'s	South American Division.
York . . . .	One III F.	"
Dorsetshire . . .	One III F.	South African Station.

But, as a rule, and particularly in the Home and Mediterranean Stations, their parent ships are in close contact, and the unit may on occasions exercise together in the air. The pilots of these units are all naval, but in other respects their personnel is constituted as in the carrier-borne squadrons. During the next few years these catapult units will increase in size as the equipment of our ships is raised to two or three aircraft apiece. It has been decided that these units will then become squadron commands.

Every naval station now has its own aircraft, though South Africa is particularly weak in this respect, having only one obsolescent III F. The Mediterranean is temporarily somewhat below its usual strength owing to the absence of the Glorious, which is at Home undergoing large repairs. Her place is being taken by the Furious and Eagle for intermittent periods. In the intervals one or two squadrons are being left at Malta where they will take their usual part in the Fleet's local practices and training while based on shore at the Hal-Far aerodrome.

#### TRAINING.

The appointment of a Rear-Admiral to the command of the aircraft-carriers was a natural result of the growing influence of the Fleet Air Arm on fleet work as a whole. The responsibilities of this post are more connected with progress in training and development than with actual tactical command. With his flag flown in a Home Fleet carrier (the Courageous) he is able to watch and direct the applications of all new technique during its tests and trials. New

types of aircraft, new catapults, accelerator and arresting gear for the carriers, new weapons and new methods of using them, all come under his immediate view while undergoing preliminary trial at sea. In close contact with the Commander-in-Chief, Home Fleet, he is able to make proposals for adapting them for their best use with the Fleet. He is likewise responsible for the sea training of the Fleet Air Arm and for its co-ordination with the Air Ministry arrangements, for which the Air Officer Commanding, Coastal Area, is responsible.

Much of the training in bombing and air fighting of F.A.A. units is carried out at R.A.F. practice camps, and for this purpose complete squadrons are landed from the carriers for periods of about a month at a time.

The work of training in other fleets is directed by their own Commanders-in-Chief through the commanding officers of the units concerned, but during each spring cruise period it is usual for the aircraft-carriers of both the principal fleets to carry out a comprehensive programme of combined training under the R.A. (Air). This period is a particularly important one, since it usually includes the several exercises in which the main fleets are in opposition to one another, and in which aircraft fulfil, of course, their war rôle on the largest possible scale. It is a period, in fact, which is looked upon as the climax of the year's training.

By means of the introduction of arrester and accelerator gear in carriers, flying has been made far more independent of adverse weather conditions than was formerly possible. Consequently, more flying can be done during any given period of time when varying conditions prevail, and a higher standard of practice can be reached.

While increasing efficiency in long-distance reconnaissance and improvements in method of bombing and torpedo attack occupy a prominent place in current training, night-flying has also made much progress during the past years. The problem is a great deal more difficult at sea than it is on land, because of the obvious objections to illuminating the deck of a carrier whose location it is hoped to conceal from the enemy. Similar objections in land aerodromes are not quite so vital, since the geographical position is nearly always accurately known. Navigation is also more difficult by night at sea, and deprived of many aids.

#### EXERCISES.

Prominence has been given in the English Press to recent combined exercises in which the three Services have taken part. Conclusions on the relative value of sea and air power have even been drawn in these accounts, from the evidences of unofficial eye-witnesses. In making such deductions, however, consideration ought to be given to the real nature and circumstances of each exercise, and a tendency to judge without knowledge of this has been sometimes evident.

In actual fact, few, if any, of these exercises have yet been staged

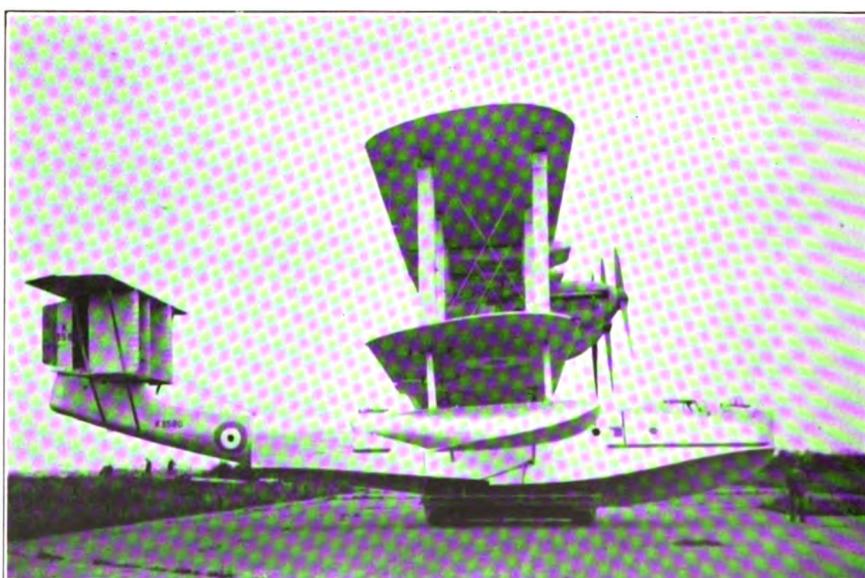




THE VICKERS-SUPERMARINE SCAPA FLYING-BOAT.

*Rolls-Royce "Kestrel" Engines.*

(By courtesy of the builders.)



THE BLACKBURN PERTH FLYING-BOAT.

*Rolls-Royce "Buzzard" Engines.*

(By courtesy of the builders. Photo by Doughtys, Ltd., Hull.)

to represent the actual conditions of war. Co-operation between Air Force units and the other Services is still comparatively in its infancy and, as a rule, no attempt to exert any pressure at the same relative fighting level has been attempted. All three Services have been far more concerned with accustoming each other to the arrangements for co-operation which combined work demands—with teaching each other, by elementary steps, what to see and what to expect—than with pitting their forces by tactical skill in any kind of air *versus* gun contest.

The most important recent example of the kind was the exercise carried out near the Firth of Forth in September, 1933. In this the naval movements were artificially restricted, so as to ensure a contact with the air forces before the coast was reached. Conclusions on the efficiency of coastal reconnaissance, for example, drawn from this exercise are obviously of little value. Until many further exercises under progressively more realistic conditions have been carried out, the Services are wisely refraining from making any claims of relative predominance in coastal operations. The Navy knows that it has now the air factor to contend with in carrying out its age-old responsibilities, and that this factor may be either very great or almost non-existent owing to varying circumstances of place and weather. The Air Force knows its own limitations, and to what extent adverse conditions can be counteracted by improved training and technique. These exercises are not staged to dispel illusions, but to develop co-ordination and defence.

The Yorkshire coast was the scene of an important invasion operation in September, 1934, in which all three Services took part. Home Fleet ships, including the Courageous, Army units of importance, and five squadrons of the Royal Air Force took part, but details of the exercise, or the conclusions which may be drawn from it, are not yet available. It has been officially explained that the nature of the operation was mainly that of a staff exercise.

#### MARINE AIRCRAFT.

The problem of developing aircraft suitable for operation over the open sea, has become directed into two distinct fields of investigation. As far as the designer is concerned, this division is accidental rather than intentional, and follows upon the assignation to the Air Ministry of the operational control of all coast defence units.

An apparent anomaly has been reached by which the aircraft which fly constantly over the most open seas in all parts of the world, are the small wheeled aircraft of the carrier, while the great multi-engined flying-boat is a denizen of the harbour, estuary, or narrow seas. These circumstances have brought about the odd arrangement by which the Admiralty are interested in the development of the land plane for ocean work, while the Air Ministry alone are responsible for the development of the flying-boat now used for coastal defence.

Flying-boats have grown greatly in size, and their range, performance, and fighting power have been improved correspondingly.

But they are still unable to alight or take off in anything of a sea as the sailor knows it, and their size absolutely precludes their embarkation in aircraft-carriers or catapult-ships. Their operation has consequently to be confined to coastal waters within easy range of shelter ; this puts an absolute limitation upon their value as a substitute for daylight ocean-going patrol vessels.

There seems as little likelihood as ever that the large independent flying-boat will reach such a size and strength as to make its landing on the open sea a practical possibility without the aid of a ship. Even the most stoutly built vessels are often obliged to reduce their speed to avoid damage by the waves. A flying-boat's hull capable of withstanding the shock of wave-blows at the speed of landing or taking off in even moderate weather, could hardly be made light enough for flying purposes.

The inference is that the ocean-going aircraft of the future will require a ship for a base. They will thus be more completely mobile than any shore-based units, and their uses and development may be expected to take place under naval auspices.

The coastal units of to-day may possibly lose their maritime nature altogether, as that is a seriously limiting factor when suitable harbours or estuaries are necessary for their operation. These are not always to be found at places where coastal air patrols are needed. It does not, therefore, seem unlikely that at some future date the flying-boats will be abandoned by the Air Force for naval co-operation work in favour of land planes based on coastal aerodromes ; and the Navy will adopt them again, smaller in type, for purely maritime purposes.

VOLAGE.

## CHAPTER XIII.

### FOREIGN FLEET AIR ARMS.

#### UNITED STATES.

THE Naval Air Service of the United States is by far the most powerful in the world to-day, and if the building programme authorised under the Vinson Act is adhered to, then the difference in size between the U.S. Naval Air Service and that of the next largest, Japan, will become even more pronounced. Mr. Swanson, Secretary of the Navy, stated on July 18, 1934, in Washington, that the above-mentioned building programme would be pushed on energetically, and it is intended that 910 aircraft should be added to the already existing 1,000 aircraft of the Naval Air Service by 1942; 225 aircraft are to be built during the coming year, and the rest in proportionate annual instalments.

*Organisation* (see "Annual" for 1932).—The Naval Air Service comes directly under the Secretary of the Navy, and has no connection whatever with any other flying services in the United States.

*Finance*.—The direct appropriation for the financial year 1934/35 was \$18,648,000, which is a small decrease on that for the previous year. However, with the appropriations under the Vinson Act, from the Public Works Fund, there will actually be a considerable increase.

*Personnel*.—Rear-Admiral E. J. King, U.S.N., became Chief of the Bureau of Aeronautics in succession to Rear-Admiral Moffet, U.S.N., when the latter was killed in the loss of the U.S. Naval Airship Akron, on April 4, 1933. The Assistant Chief of the Bureau of Aeronautics is Captain A. B. Cook, U.S.N. Rear-Admiral John Halligan, U.S.N., flies his flag in the Saratoga, and Rear-Admiral A. W. Johnson, U.S.N., in the Wright.

The total personnel of the U.S. Naval Air Service is given as 12,286, but this includes the officers and men of the aircraft-carriers and tenders. Of this number 826 are officer pilots and 337 N.C.O. pilots. In addition there is the personnel of the Marine Air Corps, consisting of 118 officers, 108 of whom are pilots, and 950 N.C.O.'s and men, of whom 30 are pilots.

*Ships Carrying Aircraft*.—The following carriers are in commission:—Saratoga, carrying 80 aircraft; Lexington, 79 aircraft, with 1 Norden catapult; and the Langley, with 38 aircraft and 2 catapults. The Ranger has completed her acceptance trials and has recently joined the fleet (August, 1934). She is of 13,800 tons, carries 72 aircraft, did 34 knots on trial, has a ship's company of

1,300 and was built at Newport at a cost of \$21,000,000. There are also building at Newport News two other carriers, the Yorktown and Enterprise, both of 20,000 tons and both due to be completed in 1936 ; and in addition the Vinson Act authorises the building of a further carrier of 15,000 tons to replace the Langley.

*Aircraft Tenders.*—The Wright carries 31 floatplanes ; the Heron, 2 floatplanes ; and the Patoka, which carries no aircraft, is fitted with a mooring mast. There are also the following minesweepers which act as tenders to aircraft, though they carry none themselves : Sandpiper, Gannet, Lapwing, Pelican, Avocet, Teal, and Swan.

*Other Ships Carrying Aircraft.—Battleships.*—All aircraft allocated to battleships are of the "observation" type, and are carried as follows : U.S.S. West Virginia, Colorado, Maryland, Arizona, Pennsylvania, Nevada, and Oklahoma, each with 3 floatplanes and 2 or more catapults ; Texas, New York, and Arkansas, each with 3 floatplanes and 1 turret catapult.

*Cruisers.*—All aircraft carried in cruisers are of the "scouting" type and are fitted as follows : San Francisco, 6 floatplanes and 2 catapults ; New Orleans, 4 floatplanes and 2 catapults (powder) ; Portland and Indianapolis, 4 to 6 floatplanes and 2 catapults ; Augusta, Louisville, Chicago, Houston, Chester, Northampton, Pensacola, Salt Lake City, 4 floatplanes and 2 catapults ; Memphis, Marblehead, Trenton, Richmond, Concord, Raleigh, Detroit, Cincinnati, Milwaukee, and Omaha, 2 floatplanes and 2 catapults. It seems probable that the cruisers laid down in 1935 will have 2 catapults and 4 floatplanes, while the 7 Coastguard cutters now building will carry 1 floatplane each.

*Aircraft.*—There is at present an establishment of 1,000 aircraft in the Naval Air Service. These aircraft are mainly of fabric-covered metal construction, and air-cooled engines are used exclusively. Types of aircraft are as follows :—

#### SHIP-PLANES.

Fighter.—Curtiss F-11C, Grumman FF-1, Boeing F4B4, and Boeing F4B2.

Observation.—Curtiss O2C-1.

Torpedo Bomber.—Martin BM-2 and Great Lakes TG-1.

Transport.—Atlantic RA-3, Ford RR-2, Ford RR-4, Curtiss RC-1.

Scouting.—Vought SU-2 (convertible to single-float seaplane), and Vought SU-3.

#### FLOATPLANES.

Observation.—Vought OU-3, and Berliner Joyce OJ-2.

Patrol.—Douglas P.D.-1, Martin P3M-2, Martin PM-1, Martin PM-2, Keystone PK1, Consolidated P2Y-1.

#### AMPHIBIANS.

Utility.—Loening OL-8, Loening OL-9, Douglas R.D-1, Vought O3U-1.

Transport.—Sikorsky RS-3.

Most naval aircraft are constructed by contract with the industry, but there is a naval aircraft factory at Philadelphia, and this factory is going to construct one-tenth of the naval aircraft authorised under the Vinson Act.

*Lighter-than-Air Craft.*—The whole future policy of the U.S.



THE HAWKER NIMROD FLEET FIGHTER.

*Rolls-Royce "Kestrel" Engine.*



THE HAWKER OSPREY FLEET FIGHTER RECONNAISSANCE AIRCRAFT.

*Rolls-Royce "Kestrel" Engine.*

*(By courtesy of the builders. Photos by "Flight" and "The Aeroplane.")*

NO. 111.  
AUGUST 1873.

Navy Department with regard to lighter-than-air craft is now under consideration, and the fact that the Macon broke two girders during recent Fleet exercises may lead to a change of policy. However, at the moment the position is as follows : The Rigid ZRS-5 "Macon," which carries 5 Curtiss S.S. fighter aircraft, is in commission. The Los Angeles has been condemned for active service, and will in future be used for non-flying instruction only. The non-rigid types J and K are used for training only.

*Bases* (see "Annual" for 1932).—In addition there is a new station at Sunnyvale, California, on which the Macon is based.

#### FRANCE.

Since the publication of the Decree of 1932, the French Naval Air Force has been in the process of reorganisation ; and though the "Air Force Constitution Bill" of 1933 will eventually alter the responsibilities of the Ministers for Air and Marine, the organisation of the Naval Air Force is still governed by the Decree of 1932.

*Organisation*.—Under this Decree the Naval Air Force is divided into three distinct organisations : (1) The Naval Air Force Afloat. (2) The Shore-Based Co-operation Units. (3) The Autonomous Naval Air Force. The Naval Air Force Afloat and the Shore-Based Co-operation Units are part of the French naval organisation, and come directly under the Minister for Marine, M. Pietri, though the Air Minister, General Denain, is responsible for all *ab initio* flying training, and for the supply of air material after requirements have been stated by the Minister for Marine. The Autonomous Naval Air Force comes directly under the Minister for Air, but "it may be placed at the disposal of the Ministry of Marine if it is not required by the Government for other duties." At the moment it is composed of naval officers seconded to the Air Force, but this is a temporary measure until Air Force officers are trained in naval work ; for the Autonomous Naval Air Force is intended to be a coast defence organisation, primarily for the defence of naval and important commercial ports.

The effects, then, of these arrangements are : (1) The Naval Air Force Afloat comes under the orders of the Admiral in whose fleet it happens to be embarked. (2) The Shore-Based Co-operation Units come under the Prefect Maritime of the Region they are in. (3) The Autonomous Naval Air Force units are, at the moment, partly in North Africa, where they are, with the rest of the Air Force units stationed there, being organised into the new 5th Air Region, and partly under the 3rd Air Region.

*Regions*.—There are four Naval Regions with H.Q. respectively at Dunkirk, Brest, Marseilles, and Bizerta. Each Region has, subordinate to the Prefect Maritime of the Region, an admiral or captain as its Air Officer Commanding, and under his command come all air bases and stores depots in the Region. The only exception to this is the Stores Depot at Orly, from which all the Naval Air Force is supplied, and which comes directly under the control of the Minister for Air.

*Finance.*—Out of a total air budget of 1,823,515,096 francs, the estimate for the Naval Air Service is 300,866,210 francs, and in addition to this there is a special estimate of 1,170,000,000 francs, of which 190,000,000 is for naval aviation. These estimates, on the whole, show a substantial increase on those of the previous year, but owing to so much of the money being spent on re-equipment, only a very small expansion of the Naval Air Force will result.

*Personnel.*—According to a recent article in the French Press, the personnel of the French Naval Air Force stands at 220 officers and 4,640 men, to which must be added the personnel of the Autonomous Naval Air Force, which has 35 officers and 1,650 men.

*Ships Carrying Aircraft.*—Carriers.—The only carrier possessed by France is the Béarn, which normally carries 29 ship-planes, and in addition 11 aircraft dismantled and in store. She has, however, just paid off and been taken in hand for a large refit at Toulon, which is not due to be completed till the end of 1936.

*Seaplane-Carriers.*—The aviation transport, Commandante Teste, carries 19 seaplanes, with 8 more dismantled and in store, and is fitted with 4 catapults.

*Battleships.*—No French battleships at present carry aircraft, but it is understood that the Dunkerque, which is now building, will be fitted with a catapult, and will carry 2 to 3 seaplanes of the "surveillance" type.

*Cruisers.*—All aircraft in cruisers are of the "surveillance" type, and are carried as follows : Jeanne D'Arc, Douay Trouin, Lamotte Picquet, and Primauguet, each carry 1 catapult and 1 seaplane ; Algerie has 2 catapults and 2 seaplanes ; Dupleix, Foch, Colbert, and Suffren have 2 catapults and 3 seaplanes ; Duquesne and Tourville, 1 catapult and 3 seaplanes ; Waldeck Rousseau, 1 seaplane.

*Other Ships carrying Aircraft.*—Minelayers D'Entrecasteaux, Bougainville, Savorgnan de Brazza, and Dumont d'Urville each carry 1 catapult and 1 seaplane ; the submarine Surcouf is fitted to carry 1 seaplane. It is understood that of the ships completing during 1934 the cruisers Jean de Vienne, La Galissonnière, Gloire, Marseilles, Montcalm, Georges Leygues, and the fast offensive cruiser minelayer Emile Bertin, are each to be fitted with one catapult and are to carry two seaplanes.

*Aircraft.*—The following squadrons are at present in existence and are based as shown (C=Fighters, B=Torpedo Bombers, S=Surveillance, or short reconnaissance, E=Exploration, or long reconnaissance) : Normally embarked, but based at Hyères during refit of Bearn, Squadrons 7C1, 7B1, and 7S1. Embarked in Commandante Teste, 7B2 and 7S2. At Cherbourg, 1E1. At Brest, 2S1. At Berre, 3B1, 3B2, 3E1, and 3E2. At St. Raphael, one E Squadron. At Hyères, 3S1. At Bizerta, 4E1, 4S1, and 1B1. There are two squadrons of surveillance aircraft embarked in the cruisers of the fleet, and of the Autonomous Naval Air Force : Squadrons 4B1, 4B2, 4B3 are at Bizerta ; 3C1 at Hyères ; and 3C2 and 3C3 at Marignane.

*Types of Aircraft.*—Ship-planes.—Levasseur PL7 (torpedo

bomber) ; Wibault 74 (fighter) ; Nieuport 62 (fighter) ; Potez 25 (general purpose).

Seaplanes.—Farman 168 (torpedo bomber) ; Gourdon Leseurre 810 (spotter reconnaissance) ; Levasseur PL 14 (torpedo bomber) ; Latecoere 29 (torpedo bomber).

Flying-Boats and Amphibians.—C.A.M.S.55 ; C.A.M.S.37 ; Levasseur PL 10 ; Breguet Short : all of which aircraft are used for reconnaissance.

*Lighter-than-Air Craft.*—Very little is now being done with lighter-than-air craft, though there is still the school at Rochefort, and the following craft are still in existence (E = Escorteur of 10,000 cu. m. capacity ; V = Vidette of 8,000 cu. m. capacity) : E5 and E8 are in service ; E3, E6, and E7 are in reserve ; V3, V9, and V11 are in service, V1, V2, V4, V5, V6, V7, and V8 are in reserve.

*Bases.*—Money has been voted for a new air station near Brest.

#### JAPAN.

The Imperial Japanese Naval Air Service is second in size only to that of the United States. Comparatively little is known of it, but it is believed to have embarked on a programme of expansion. The number of aircraft at present in the Japanese Naval Air Service is something under 400, but by 1938 it is believed that they will have, including reserves, about 1,000 aircraft.

*Organisation* (see "Annual" for 1932).—The Naval Air Service, which is itself divided into two branches, shore-based and ship-borne, has no connection whatever with any other flying activities in Japan, and it comes directly under the Japanese Admiralty.

*Personnel.*—In 1931 the Japanese authorities informed the League of Nations that the total personnel of the Naval Air Service was 9,877, but with the expansion of this Service these figures must be increasing rapidly. It is probable that nearly 1,000 pilots have already been trained, and it is reported, unofficially, in the Japanese Press, that a further 1,500 pilots will be trained for the Naval Air Service during the next three years.

*Training.*—It is understood that the period of *ab initio* training for naval pilots has recently been very much reduced, while great importance is attached to the night-flying and long-distance flying carried out by the trained pilots. In view of the excellent results obtained by the special training of civilian pilots at Tororozawa Army Air Service School, the Imperial Aviation Society has, according to the Press, obtained permission from the Naval Air Service Authorities for 81 civilian pilots to undergo training at the Naval Flying Training School at Yokosuka.

*Accidents.*—In the Naval Air Service there were : In 1931, 69 crashes involving 18 deaths and 2 serious injuries ; in 1932, 12 deaths and 5 seriously injured ; while in the first ten months of 1933 there were 79 accidents in which 26 airmen were killed and 11 seriously injured.

*Ships Carrying Aircraft.*—Carriers.—The Hosho (fitted with a stabiliser) carries 20 aircraft; Kaga carries 60 aircraft; Akagi, which is fitted with 1 catapult, carries 48 aircraft; and Ryujo carries 24. Two new carriers of 10,000 tons each are projected in the 1938 programme.

*Seaplane-Carriers.*—The Kamoi and Notoro each carry 16 seaplanes, while the building of three additional seaplane-carriers is projected.

*Battleships.*—All battleships are fitted with catapults and each carries from 1 to 3 seaplanes.

*Cruisers.*—The "Takao" class (4 ships) have 2 catapults and carry 2 seaplanes. The "Nachi" class (4 ships) have 1 catapult and carry 2 seaplanes. The "Furutaka" class (4 ships), "Sendai" class (3 ships), "Natori" class (3 ships), and the "Kuma" class (5 ships) are all fitted with 1 catapult and carry 1 seaplane.

*Other Ships carrying Aircraft.*—The submarine depot ship Taigei carries 3 seaplanes, and the parent ships for submarines, Chogei and Jingei, each carry 1 seaplane.

*Types of Aircraft.*—The Imperial Japanese Naval Air Service has at present 19½ Squadrons, and the types of aircraft are as follows:—

Fighters, Navy type 3 (ship-plane); Navy type 90 (ship-plane);

Reconnaissance, Navy type 14 (ship-plane); type 15 (seaplane);  
type 90 (seaplane); type 90-2 (seaplane);

Bombers, Navy types 18 and 89;

Patrol and Bombing, Navy type 15 (flying-boat); type 90-1  
(flying-boat); type 90-2 (flying-boat);

Training, Navy type 18 and Avros.

The manufacture of aircraft is carried out at Hiro and Yokosuka Naval Yards, and also by aircraft firms such as the Nakajima, Mitsubishi, Aichi, and Kawanishi Companies. The Japanese Press states that the capacity of the aircraft factories in Japan has increased since 1931 from 300 to 1,000 aircraft per annum.

*Lighter-than-Air Craft.*—It would seem that little interest is being taken in lighter-than-air craft. It is believed that three British "SS" type non-rigid, and one Japanese type airships are still in existence, but it is understood that they are in the course of disbandment.

*Bases.*—The bases for the squadrons of the Naval Air Service are at Kasumigaura, Kure, Maidzuru, Ohmura, Port Arthur, Saeki, Sasebo, Tateyama and Yokosuka. The Press reports that the Japanese naval authorities have decided to open a naval air station at Ominato, south of the Island of Hokkaido, Northern Japan, and that about 450 officers and men are going to be stationed there. In order to facilitate the transportation of officers, a Fokker passenger aircraft has been supplied to each naval air station in Japan. It has been announced that it is intended to construct aerodromes and landing grounds in the mandated islands in the South Seas "in order to facilitate communications between the islands and Japan."

## ITALY.

The actual numbers of aircraft of the Regia Aeronautica which are employed on naval flying show no increase, but all the equipment is being modernised. The Italian aviation authorities show little interest in seaborne aircraft beyond those which are actually carried by the ships of the Fleet. They have, however, carried the development of the flying-boat further than any other nation.

*Organisation.*—The Naval Flying Service of Italy is an integral part of the Regia Aeronautica, and as such, except for those aircraft actually embarked in the Fleet, comes directly under the Chief of the Air Staff, General Valle, who recently relieved Marshal Balbo.

*Finance.*—The total vote for the whole Regia Aeronautica, which includes the Naval Flying Service, is, for the year 1934/35, 720,000,000 lire, an increase on the previous year.

*Personnel.*—Dating from the end of 1933 there are air force pilots only in the Naval Flying Service, though naval officers are still attached as observers.

*Ships carrying Aircraft.*—The seaplane-carrier Miraglia has 2 catapults and carries 9 aircraft of the M18 and P6 ter types.

*Battleships.*—The Andrea Doria, Caio Duilio, Conte di Cavour, Giulio Cesare, all carry 1 catapult and 1 aircraft, type M18.

*Cruisers.*—The Bolzano, Fiume, Trento, and Trieste each have 1 catapult and carry 2 aircraft, type P6 ter; the Armando Diaz, Luigi Cadorna, Pola, Giovanni delle Bande Nere, and Alberico da Barbiano, each have 1 catapult and 2 aircraft, type Cant 25; the Gorizia carries 1 catapult and 2 aircraft, type MF4; the Zara has 1 catapult and 2 aircraft, type Cant 35; the Bartolomeo Colleoni and Alberto di Giussano have 1 catapult and 2 aircraft, type M71. It is understood that the two cruisers building, Monte-cuccoli and Muzio Attendolo Sforzo, will be fitted with 1 catapult and will carry 4 aircraft each.

*Types of Aircraft.*—There are 14 sea reconnaissance squadrons in the Regia Aeronautica, which have 9 aircraft in each, amounting in all to 126 aircraft. There are also 10 sea bomber squadrons comprising 90 aircraft, and in addition 89 aircraft which are liable to be embarked in the ships of the Fleet, including the Miraglia. The following types of aircraft are to be found in the Regia Aeronautica for use on sea duties:—

*Fighter.*—Fiat CR20 (seaplane); Macchi M41 bis (flying-boat); Cant 25 (flying-boat); and Macchi M71 (flying-boat).

*Reconnaissance.*—Savoia S62 bis (flying-boat); Piaggio P6 ter (seaplane); Savoia S59 (flying-boat); Macchi (flying-boat); MF4 (flying-boat); Cant 35 (flying-boat).

*Reconnaissance or Bomber.*—Savoia S55 (flying-boat, twin hull, monoplane).

*Bomber.*—Dornier Val (flying-boat, Italian built).

All naval aircraft are made by civil contract with such firms as Macchi of Lake Varese, Milan; Cant of Monfalcone; Piaggio of Genoa; and Savoia of Milan.

### BELGIUM.

Belgium has no Naval Air Service. The Military Air Service, which is part of the Army, is under the command of General Gillieaux and has a personnel of about 2,800, of whom about 400 are flying personnel. This force is equipped mainly with aircraft of British design.

### SPAIN.

The Naval and Military Air Forces of Spain have been in the process of reorganisation during the past year, but owing to political unrest and lack of funds, it is doubtful how much progress has been made.

*Organisation.*—By a decree made on April 6, 1933, the Government authorised the formation of a "Directorate General of Aviation," thus providing a common Directorate for what will remain the two separate air services of the Army and Navy. This decree also sanctions the creation of a "Higher Air Council." The Director General of Aviation is to be one of its members, the other members being the Chiefs of Staff of the Army and Navy and three politicians. The air forces are to be under the command of a naval or military officer to be known as "Chief of the Air Forces." He is to have direct and full control of all branches, except that for purposes of operations and discipline the Army and Navy branches are to come under the Military and Naval Commands to which they are affiliated.

*Finance.*—The State Budget for 1933 provided Pts. 6,000,000 for naval aviation.

*Personnel.*—The personnel of the Naval Air Service consists of officers and men seconded from the Navy for varying periods.

*Ships carrying Aircraft.*—The seaplane-carrier *Dédalo* has stowage, forward, for one small airship 42 metres long, and aft has accommodation with a normal capacity of 25 seaplanes, 2 dirigibles, and 2 balloons. She is fitted with a mooring mast forward, and in the after part of the ship is deck space, on which, on March 9, 1934, a "direct control" autogyro landed successfully.

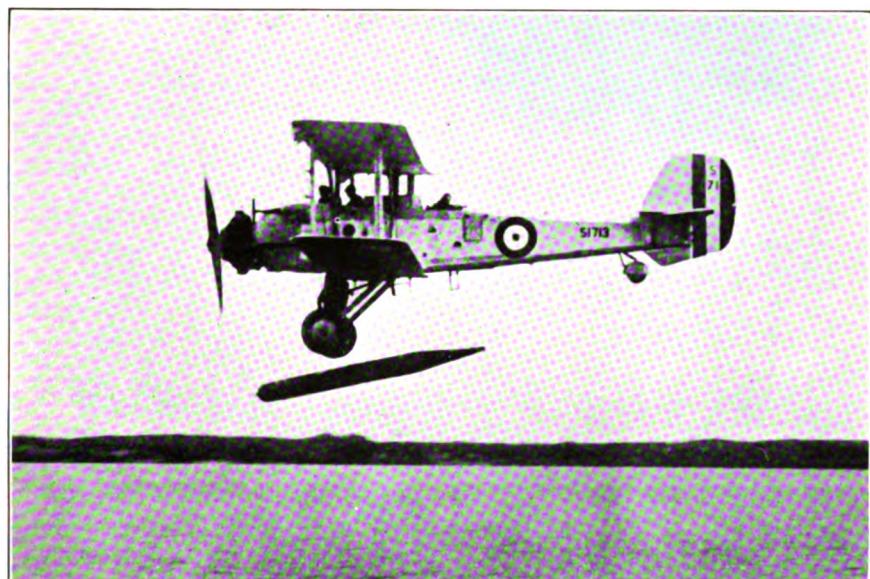
At present no aircraft are carried in battleships or cruisers, but it is understood that the two cruisers which are building at Ferrol, and which are due to be completed in 1935, will mount 1 catapult and carry 2 seaplanes.

*Aircraft.*—The following types of aircraft are in use in the Spanish Naval Air Service:—

Landplanes.—Martynside F4; Martynside F6; Blackburn Swift; Vickers Vildebeest; and for training, Avro 504K.

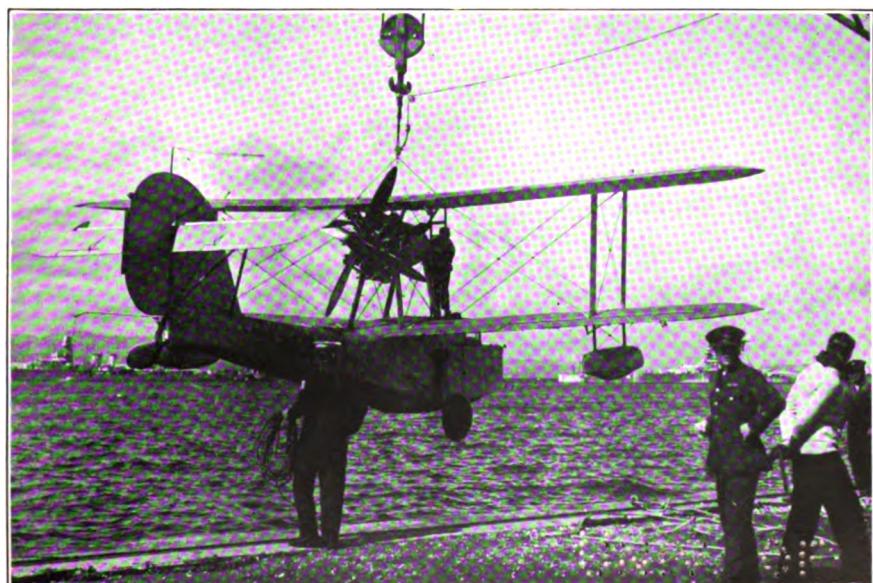
Flying-boats.—Macchi 18; Savoia 62; and Spanish-built Dornier Val.

Aircraft, other than those purchased abroad, are constructed for the Spanish Naval Air Service by C.A.S.A. at Cadiz, while repairs to aircraft are carried out by the Military Repair Factory at Cuatro Vientos. Engines are constructed by Loring and Hispana-Suiza at Madrid, and by Elizalde at Barcelona. It is understood that in the



THE VICKERS VILDEBEEST TORPEDO BOMBER.

*Bristol "Pegasus" Engine.*



THE SUPERMARINE SEAGULL AMPHIBIAN

*Bristol "Pegasus" Engine.*

(By courtesy of the builders. Seagull Photo by C. E. Brown.)

40. Mittlere  
Ausdehnung

early part of 1933 work was started on 27 Vildebeest aircraft by C.A.S.A. under licence from Vickers Aviation, Ltd., England.

*Lighter-than-Air Craft.*—Little interest is being taken in lighter-than-air craft, but it is understood that there is still one semi-rigid airship of 3,000 cu. m. in service. One non-rigid airship of 1,500 cu. m. is deflated, one semi-rigid of 1,500 cu. m. requires reconstruction, while 1 free balloon and 2 kite balloons are in store.

*Bases.*—The Naval Air Service has bases at San Javier, Barcelona, Port Mahon, Tetuan, Melilla, and Larache. In addition a new base has been established at Pollensa to protect the Balearic Islands.

#### YUGOSLAVIA.

The Naval Flying Service comes directly under the control of the Naval Commander in Belgrade, and is quite separate from the Military Flying Service. The Naval Aviation command was formed in 1930 with headquarters at Split, and stations at Split and Vodice. There is also one seaplane-carrier, the Zmay, which is capable of carrying 5 to 7 seaplanes with their wings folded. There are two naval aviation groups, each consisting of three squadrons, one of which, in each case, is a training squadron.

The types of aircraft in use are as follows : bomber, Dornier Val (flying-boat); torpedo bomber, Dornier D.O.D. (floatplane); reconnaissance, Icarus (floatplanes and flying-boats); and Fezir (floatplane). Several of the above types are also used for training, but the D.H. Moth and the Hanriot H36 are used exclusively for training. The "Icarus" types are constructed at Novisad, and the "Fezir" type floatplane is designed and constructed in Yugoslavia.

#### TURKEY.

The Turkish Air Services are controlled by a department of the Ministry of Defence, the head of the department being Major-General Selim-Cevat-Pasha. The Air Force is divided into three regiments, and each regiment is divided into squadrons. One of these squadrons is based at Smyrna and is equipped with 6 Savoia S6 ter and 1 Rohrback (Rodra) flying-boats. There is no distinction between the flying-boat and any other squadron. Turkey has recently purchased 6 Southampton Mark II flying-boats. Delivery has now been completed, but where they will eventually be based is not known.

There is an aircraft factory at Kaisariya, and it is run under a licence, obtained in 1932, by the Curtiss Aircraft Company of America. There, Curtiss engines and aircraft are manufactured for the Turkish Air Forces. There are French flying instructors at the main Flying Training School and Depot at Eskishehr. The whole defence budget of Turkey is on the increase, but the amount of money devoted to aviation depends entirely on the success experienced by the aviation lotteries.

## SOVIET RUSSIA.

Very little is known about aviation in Soviet Russia, but in November, 1922, the organisation of a unified Air Force was ordered. The Soviet Air Force was to be a distinct arm within the Red Army. For administrative purposes, units of the Soviet Air Force come under a Central Air Force Administration, but for operational purposes Air Force units are under the control of the various Army District Commanders and Naval Commanders-in-Chief. This organisation, it is thought, is in force now.

In Soviet Russia there are various research establishments, such as Tsagi (of which the Chief Engineer is A. N. Toupolev, by whose initials several successful types are known), which design and develop new types of aircraft and engines. On acceptance, the successful types are put into production at various factories, of which there are about seventeen. One of these factories, the Krassni Lotschik in Leningrad, builds two-seater flying-boats and "Avro" training aircraft. The Amstro works at Ruibinsk and the "9 Sawod" works, both in the Ukraine, are organised for the production of engines, whilst the most important factory of all is Koltchugina, whence comes the supply of koltchugalumin, the Russian equivalent of duralumin. In accordance with the requirements of the Five-Year Plan, the following quantities and types, amongst many others, were allowed for: 12 torpedo seaplanes, 68 bomber seaplanes, 242 fighter seaplanes, 86 reconnaissance seaplanes, 18 school seaplanes, 6 light escort airships (French "Zodiac" type), and 16 observation balloons.

Of what types these aircraft were to be is not specified, but the following types are known to be in use: the Gregorovitch flying-boat, which takes its name from the designer in the O.S.S.Z.K.B. establishment; the SH5 amphibian, designed by Engineer Shavrov, and for which it is claimed that it can be used on water, land, or snow, and it is believed that a number of Savoia flying-boats have been bought from Italy. Russia possesses no aircraft-carrier, although there are persistent rumours that she intends to construct one, but about thirty-five of her warships are capable of carrying aircraft, both of the seaplane and flying-boat types. As a general rule, these are only carried during the summer months.

It would be illogical if these preparations did not include the formation of torpedo bomber squadrons and squadrons of other types of naval aircraft. Rumours indicate that these do, in fact, already exist.

## ROUMANIA.

The Air Forces of Roumania, known as "Divisia-I a Aeriana," are part of the Army organisation, and are under the command of General Irimescu. These forces are divided into six groups, one of which consists of three squadrons equipped with eighteen Savoia flying-boats of various types, based on Constanza. The aircraft firm I.A.R. have produced new types of aircraft of Roumanian design, and the authorities hope, in time, to produce aircraft at this

factory to replace aircraft of foreign design, which have hitherto been bought abroad or made under licence. There are also, attached to the Arsenal, workshops for the repair and construction of aircraft and engines, with a capacity, it is said, of about 100 aircraft a month. The Roumanian Air Force keeps in close touch with foreign aeronautical development through missions sent to England, France, and Italy.

#### CZECHOSLOVAKIA.

The Air Forces of Czechoslovakia, which consist of six Air Regiments, come under the Department for Aviation in the Ministry of Defence. None of these Regiments, however, have anything to do with nautical aviation, either on the sea or on their rivers, nor have they any marine aircraft.

#### POLAND.

The Naval and Military Air Forces of Poland are separate Services, though they both come under the control of the Air Department of the Ministry for War. The Chief of the Air Department is Colonel Rayski. The Naval Flying Division has its headquarters and flying school at Puck, with a detachment at Pinsk. It is reported in the Press that at these two bases there are: three reconnaissance squadrons of 48 aircraft, two torpedo squadrons of 24 aircraft, and three fighter squadrons of 16 aircraft, making in all eight squadrons with a total of 88 aircraft.

The following types of aircraft are in use in the Naval Flying Division: L.E.O. H13 (reconnaissance flying-boat); Latham HB3 (reconnaissance flying-boat); PZL Fighters and Schreck HMT2 (amphibians for training). All aircraft and engines are of Polish manufacture, and the performance of the fighter aircraft, manufactured by the P.Z.L. factory at Warsaw, is comparable to that of the best in the world. The State factory is engaged on the construction of many foreign types, under licence. Steps are now being taken to develop the Naval side of Polish aviation, and purchases have recently been made of twin-engine C.A.M.S. flying-boats and Levasseur PL7 torpedo bombers.

#### HOLLAND.

The comparatively small Naval and Military Air Services maintained by Holland, at home and in her Colonies, are by no means indicative of the amount of interest taken in Service aviation, for the general policy is to train a large reserve of pilots and mechanics, who can be called on in times of emergency. Hence the large number of training aircraft to be found in the Air Services.

*Organisation.*—Both the Naval and Military Air Services come under the Ministry of Defence, though the Services themselves are entirely separate. The Naval Air Service is part of the Royal Netherlands Navy, and as such is a unified organization, both in the Netherlands and in the Colonies. The H.Q. of the Naval Air

Service is at den Helder, with a naval commander in command ; the H.Q. of the Colonial section is at Sourabaya, with a naval captain in command.

*Personnel.*—The pilots are either naval officers, officer pilots, or N.C.O.'s. The naval officers are volunteers. They go through a special course and then do a term of flying service, either at home or in the Colonies. On completion of this service they can elect either to go on flying or return to naval duty. Officer pilots are taken from civil life, and sign a contract to serve for four years on the active list and four years in the reserve. On getting their certificates as service pilots they are given the rank of lieutenant 2nd class. The N.C.O. pilots may either be volunteers from the Navy or else taken from civilian life. Naval observers are naval officer pilots who have undergone a further period of training of one year.

*Ships carrying Aircraft.*—The only ships which carry aircraft are of the Indian Military Marine, and are as follows : The cruisers Java and Sumatra carry 2 seaplanes each ; the destroyers Banckert, Van Ness, Witte de With, Van Galen, Kortenaer, Piet Hein, Evertsen, and De Ruyter carry 1 seaplane each ; the mine-layers Krakatau, Prins van Oranje, and Gouden Leeuw, carry 1 seaplane each ; the parent ship for submarines, Pelikaan, carries 3 seaplanes. It is understood that the cruiser Celebes, now building for service with the Indian Military Marine, will be fitted with 1 or 2 catapults and will carry 2 seaplanes.

*Types of Aircraft.*—The Netherlands Air Forces, though small, are extremely efficient, and are equipped with excellent aircraft. They are mainly dependent on one designer, Fokker, and nowhere is the excellence of his designs more clearly shown than in the efficiency of the Dutch N.E.I. Air Line. They are, however, entirely dependent on foreign imports for engines, which they buy from England, France, and America. The following types of aircraft are in use in the Netherlands Naval Air Service : Fokker T4 (reconnaissance floatplane) ; Fokker C VII W (reconnaissance floatplane) ; Fokker Brandenburger (training floatplane) ; Dornier Val (reconnaissance flying-boat) ; Van Berkel W.A. (training floatplane). Aircraft for the Naval Air Service are made by Fokker's of Amsterdam and also by the Aviolanda Company of Papendrecht, the latter Company having built a large number of Dornier Vals. The Military Aircraft Works, with H.Q. at Soesterberg, carry out all repairs and overhauls to aircraft and engines. The Director of these works makes all the technical and commercial negotiations for procuring new aircraft, besides controlling the maintenance of all aircraft in use.

*Bases.*—The Naval Air Service has bases in Holland at de Mok (Texel), Schellingwoude (near Amsterdam), Veere (Zeeland), and their Flying Training School is at de Kooy (near Helder). In the East Indies there are bases at Sourabaya, Batavia, Semerang, and in addition several places in the Archipelago are equipped with accommodation for naval aircraft.

## GREECE.

On May 31, 1931, the Naval and Military Air Services were amalgamated to form the Hellenic Air Force, under an Air Ministry. The Air Force, however, is again divided into two groups, the Army and the Navy, though they still both come under the one Air Ministry. The general training is modelled on British R.A.F. lines, and the Greek Government pay a British R.A.F. officer to act as their Air Adviser. Their attempts to reorganise are badly hampered by lack of money, the Air Vote for 1933/34 being only £188,000. The naval group of the Air Force has its H.Q. at Phaleron. Administered by this H.Q. are two reconnaissance flights at Phaleron, one torpedo bomber flight at Tatoi, one fighter reconnaissance flight at Tatoi, and the Flying School and Stores Depot at Phaleron.

*Types of Aircraft.*—The following types of aircraft are in use in the Greek Naval Air Service : Landplanes, Gloster Mars VI (fighter) ; Hawker Horsley (torpedo bomber) ; Armstrong Siddeley Atlas (reconnaissance bomber). Floatplanes, Blackburn Velos (torpedo training) ; Fairey IIIF (spotter reconnaissance). The foregoing are the main types, but the following are used for training and as general purpose aircraft : Avro, Bristol Fighter, Morane, Moth, Breguets XIX, and Potez 25 T.O.E. An aircraft factory at Phaleron is operated under contract by the Blackburn Aeroplane Company of Great Britain. All reconditioning of aircraft and engines is carried out there as well as a limited programme of new construction. The Velos, Avro, and Atlas aircraft were constructed in this factory.

ALBATROSS.

## CHAPTER XIV.

### CIVIL AVIATION.

TWENTY-FIVE years ago M. Louis Blériot, by making the first crossing of the English Channel from Calais to Dover by air, provided the excuse for somebody to remark that henceforth England was no longer an island. In the intervening period the most remarkable progress has been made in the development of aviation, a progress which is out of all proportion to that made in other forms of transport over a similar period of years. To-day aviation provides this country with a defence force of primary importance and an efficient air transport service which links Great Britain with the continents of Europe, Asia, Africa, and Australia. The linking of this country with North America with a regular air service is probably only a matter of a few years.

While international air transport has been hailed as the most civilising factor in modern progress and claimed to have greater potentialities for World peace than any other development of modern times, by the suspicious realist aviation as a whole is regarded with certain well-founded misgivings. Since the War its potentialities as a weapon which is capable of being used to destroy indiscriminately have been unduly emphasised, and in a war-weary world ready to discredit any agent which is likely to render the next war more terrible than the last, such possibilities have been seized upon to the detriment of the more humanising factors presented by the unfettered development of civil aviation.

In a memorandum presented to the 1926 Imperial Conference, Sir Samuel Hoare, the Secretary of State for Air, said, "The subject for discussion is the question of Imperial Air Communications. I propose . . . to deal with it from the civil as distinct from the military point of view. I would, however, point out at the very beginning of my remarks that the civil and military aspects are inextricably connected, and that the development of Imperial air lines . . . is a vital factor in the problem of Air Defence." In spite of this official admission of the interconnection between military and civil aviation, the policy of the Air Ministry has been one of consistent effort to divorce civil from military aviation.

The British Empire stands to-day as probably the most steadyng factor in international politics, and air transport offers the most powerful means for consolidating the Empire. This factor has been accepted by the British Government in the financial recognition of the monopolistic Imperial Airways, which receives a subsidy of half a million sterling for operating the two main Imperial air routes to South Africa and Singapore, plus certain small subsidies

from the Governments of the Dominions and Colonies through which the routes pass.

In the face of financial stringency and with the assistance of the Royal Air Force, Imperial Airways has established two great strategical airways to the Cape and the Far East, which, in the words of Sir Samuel Hoare, are vital factors in the problem of air defence. Chains of aerodromes, seaplane stations, landing grounds and anchorages, with their ancillary services, have been established through the territories which are policed by the Royal Air Force and the air forces of the Dominions, and also connect these territories with the mother country. Apart from conferring a benefit on the civil communities of the countries and territories served by the routes, by providing them with the means of rapid communication, the strategic and tactical mobility of military aviation is enhanced. In this respect, therefore, British civil and military aviation are inextricably interconnected.

From the very outset the British Government has maintained that civil aviation must "fly by itself." The need for a subsidy is recognised, but that awarded by the Government is so designed as to recompense operational efficiency and discourage any compromise between the widely divergent requirements of military and civil aviation as these apply to aircraft design.

One of the principal points of argument which has arisen in the abortive air disarmament discussions which have taken place in recent years has been the position which civil aviation would assume in the event of war. The continental view, no doubt prompted by domestic policy, is that commercial aviation represents a very serious menace because of the large number of civil aeroplanes which could be converted into bombers and so constitute an emergency striking force of considerable power. How far this would be true in actual practice remains to be seen.

The aeroplane as a weight-carrier is a potential military accessory, but in order to derive the greatest efficiency from a specific type of aeroplane it must be designed for the task it has to fulfil. In this country the design of military and commercial aeroplanes has followed two distinct paths, each using the same basic principles but applying them to the separate and distinct requirements of military and civil aviation. Here, then, is another example of how military and civil aviation are interconnected.

A healthy independent aircraft industry is the most important asset to a country which is forced to concern itself with air transport and air defence. The industry, backed by the technical and research establishments, is continually striving to find new solutions to the many problems that beset heavier-than-air flight. Some efforts may be inspired by the needs of military aviation, or *vice versa*, but their solution is of equal benefit to both branches. The reduction of structure weight, whether by the development of new materials or the invention of new methods of application or improved design, may bring several advantages, among them being greater efficiency in load-carrying for a given horse-power, cheaper methods of production, and therefore greater economies in operation

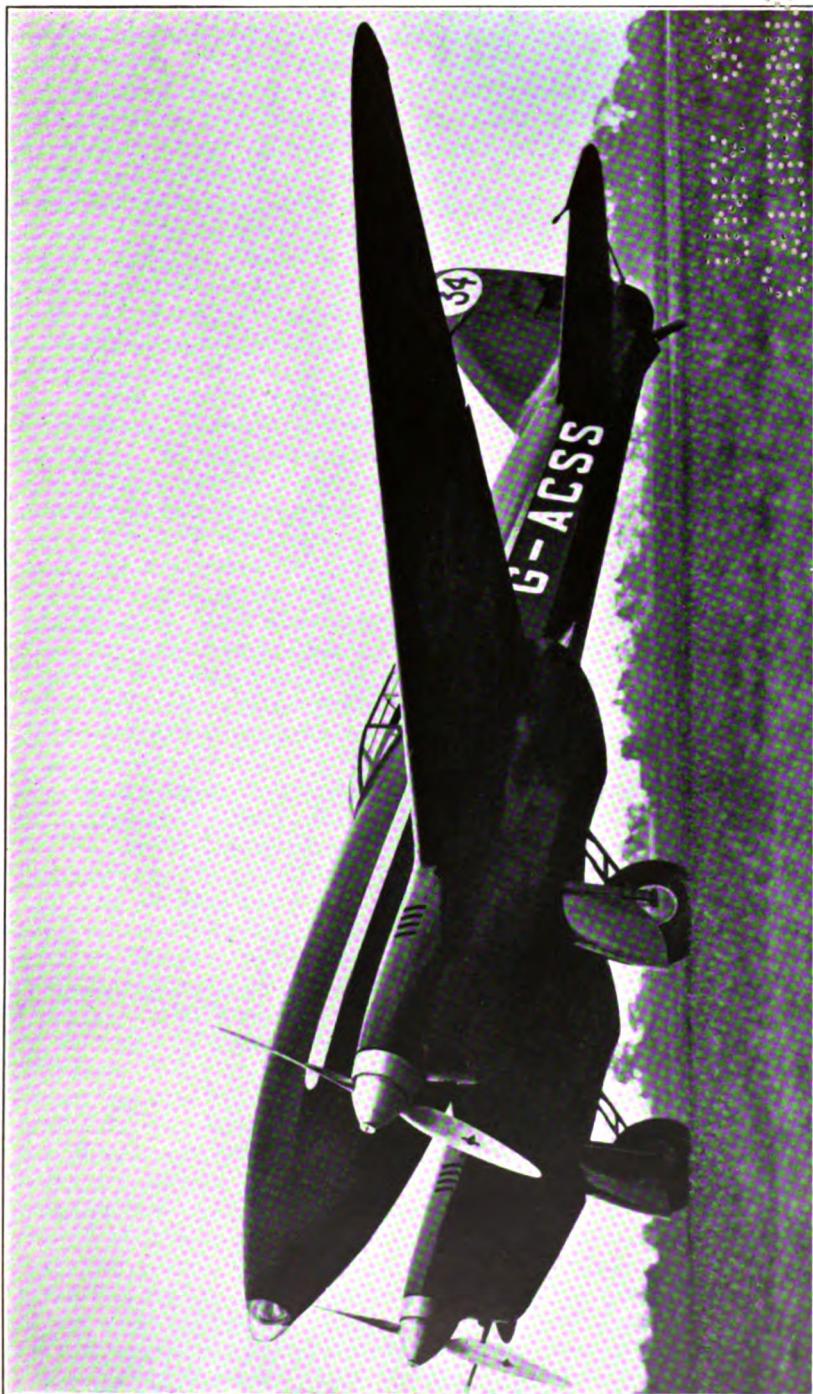
and maintenance. The invention of anti-stall devices, camber-changing flaps, retractable landing-gears, and controllable-pitch airscrews, and the general all-round progress in aircraft design all contribute to the greater safety and efficiency of aviation as a whole. Without exploring this field any farther it will be seen how far civil and military aviation are inextricably mingled in the initial stages of aircraft design and construction.

In the evolution of the commercial aeroplane in Great Britain the greatest stress has been laid on operational efficiency. Fuel economy and pay-load in relation to structure weight and horse-power have been studied in their true relation to the economics of air transport, with the result that British commercial aviation has made a closer approach towards being self-supporting than that of any other country. The passenger in any of the British air lines is carried in the greatest comfort and with the greatest economy and safety, but in ministering to the needs of the passenger and in concentrating on efficiency, high speed, which is costly, has rather been relegated to the background.

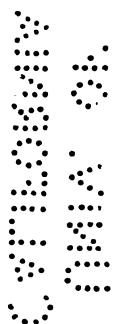
For commercial aviation to be of any use as a reserve to military aviation in time of emergency several important considerations would have to be studied. The first would be the extent to which commercial aircraft could be converted for military use by the provision of adequate armament. This would require the incorporation of certain necessary equipment and modifications in the design to allow for the installation of guns, bomb-sights, racks, etc., thereby interfering with the purely commercial requirements, adding weight and consequently reducing pay-load and/or speed. Secondly, performance and manœuvrability would have to be studied purely in view of possible future military needs. Thirdly, an uneconomically large civil air fleet would have to be maintained in order to provide an effective reserve at the time when it would most likely be needed.

These factors would require a very considerable modification of the present regulations governing the award of the British air subsidy. It would be possible to introduce certain clauses into the regulations to ensure that military requirements could be met, but the results would not justify such a step. Neither civil nor military aviation would benefit by a compromise. Eliminating the question of cost, which would be out of all proportion to the few doubtful advantages that might accrue, it would be impolitic to hinder the progress of civil aviation by saddling it with responsibilities that are definitely not its own.

So far the possibilities of British commercial aviation as an adjunct to the Royal Air Force have been discussed only in as much as they affect passenger and freight-carrying aircraft possessing characteristics similar to those of certain types of military aircraft. The emergency use of passenger-carrying aeroplanes as troop-carriers or as ambulances or for general transport or liaison work in non-combatant spheres of action is accepted, always assuming that the necessary aeroplanes are available. It must be remembered that the fleet of Imperial Airways consists of approximately



THE D.H. COMET MONOPLANE.  
*(Builders, De Havilland Aircraft Company, Hatfield.)*



thirty aeroplanes in full commission and that these are spread along the 17,500 miles of routes operated by this company.

The present trend towards high-speed air transport is producing commercial aircraft with speeds in excess of current military performance, except as regards machines in the fighter class which have no counterpart in civil aviation. The United States offers the most outstanding examples of high-performance commercial aeroplanes in the Douglas DC-2 14-passenger monoplane, which has a speed of 205 m.p.h. at 14,000 ft., the Boeing 247-D 10-passenger monoplane, which has a speed of 200 m.p.h. at 8,000 ft., and the Sikorsky S-42 four-engined flying-boat, which carries thirty-two passengers at a maximum speed of 182 m.p.h. at 5,000 ft. The first two named are produced by firms which have, until comparatively recently, confined themselves to the production of high-performance military aircraft. Other American firms, such as the Lockheed Aircraft Corporation and the Northrop Corporation, which have produced high-performance commercial aircraft, have been requested by the American Government to develop military types based on their civil models. In this it is seen how military and civil aviation in the United States are benefiting each other.

Civil aviation in the United States has been fortunate in receiving the very active support of the Post Office Department over the past eighteen years. No subsidy, such as we know it, has been given, but air-mail contracts demanding the rapid carriage of mail, without consideration of passengers and their comforts, have been awarded with a generosity unknown elsewhere in the world. This has permitted a very much larger sum of money being devoted to the development and production of civil aircraft and has given the greatest impetus to the evolution of high-speed aircraft.

But in the United States, where commercial aviation has made bigger strides than anywhere else in the world, and where the development of air lines has progressed without international interference such as is experienced in Europe, it is not generally thought that aircraft designed expressly for commercial use would be suitable for military purposes in an emergency.

The official American attitude towards the interdependence of civil and military aviation may be illustrated by some of the findings of the Baker Committee which was set up recently to investigate the operations of the Army Air Corps and the adequacy and efficiency of its flying equipment and training. The most significant statements contained in the report of this committee are as follows : " An aircraft industry is absolutely essential to national defence. The size of the air forces for a major emergency would be vastly greater than it would be prudent to maintain in time of peace. Improvements in airplanes are continuous and relatively rapid. Airplanes become obsolete in a few years and, in some cases, are already obsolescent at the time of quantity delivery. Military airplanes cannot in time of peace be stored in large quantities, as can guns, for example. This is the premise that leads to the conclusion that there must be maintained in time of peace a satisfactory nucleus of a wartime aviation industry. By a ' satis-

'factory nucleus' is meant a number of aircraft manufacturers distributed over the country, operating on a sound financial basis and capable of rapid expansion to meet the Government's needs in an emergency. The development of commercial aviation in the United States has been more rapid than in any other country and has contributed to a great increase in the design and construction facilities of American aircraft manufacturers. The number of civil and commercial airplanes produced are, however, not sufficient to maintain to any appreciable extent a satisfactory nucleus of an aircraft industry."

This is confirmation of the interdependence between military and civil aviation in so far as the aircraft industry is concerned, and these important findings apply equally to the industries of the more important aircraft-producing countries.

So long as air forces exist the importance of civil aviation as a military reserve is mainly in helping to maintain a healthy aircraft industry capable of placing its resources at the disposal of the Government in an emergency, and in training personnel. Under the latter heading come the various training establishments, flying schools and clubs, etc., many of the graduates of which, in addition to forming a useful nucleus of potential military pilots, acquire their own private aircraft, thus helping to support the aircraft industry.

An aircraft industry, adequately supported by orders from the Air Ministry and from the various commercial operating companies, schools, flying clubs, etc., and from the growing field of private ownership, provides the best foundation for air defence. The continual development that domestic production generates attracts business from abroad, and this helps in maintaining a steady flow of development and production work which peace-time home demands could not assure. The extent to which the importance of this is recognised is shown in the facilities which the Air Ministry provide for aircraft manufacturers to sell abroad their current military types.

Up to this point this article has endeavoured to visualise the interdependence between civil and military aviation from the British official point of view. There always remains, however, the international view which foresees a possible use for civil aircraft in war, including the conversion of such types for actual combatant use. The air policies of several foreign Governments no doubt provide for a very close liaison between military and civil aviation, and until international agreement can be reached to prevent the use of civil aviation for military purposes in the event of war such a state of affairs will continue to exist.

#### PROGRESS IN 1934.

Progress during 1934 was mainly in the production of the smaller type of civil aeroplane. The approach towards cleanliness of outline, the increasing use of the retractable undercarriage, and the application of the wing-flap air-brake all marked advances, and there

are indications that the characteristic British conservatism towards these developments, the efficacy of which has been demonstrated in commercial operation in the United States for the past two years, will shortly be overcome. The Airspeed "Courier," which made its first appearance in 1933, was the first British aeroplane to be fitted with a retractable undercarriage, but to-day, in spite of the admitted advantages of this fitting, it is to be found in only five distinct types of British aircraft, three of them of Airspeed design. Another aid to efficiency, the controllable-pitch airscrew, was ignored until early in 1934, when the De Havilland Aircraft Company acquired the licence to build the American Hamilton-Standard controllable-pitch airscrew in this country.

Of the smaller class of two-, three-, and four-seat cabin aeroplanes, several progressive types were produced during the year. The British Klemm "Eagle" three-seat cabin monoplane, with retractable undercarriage and D.H. "Gipsy-Six" engine, has a maximum speed of 170 m.p.h., a cruising speed of 148 m.p.h., and a range of 600 miles. The 1934 Percival "Gull" three-seat cabin monoplane, with 200-h.p. D.H. "Gipsy-Six" engine, has a maximum speed of 166 m.p.h., a cruising speed of 152 m.p.h., and a range of 500 miles. The Miles "Falcon" four-seat cabin monoplane, with 130-h.p. D.H. "Gipsy-Major" engine, is still in the experimental stage. These are three examples of a type of aeroplane which has been making steady progress in this country.

Imperial Airways made a few additions to its fleet during 1934. Two Short four-engined 39-passenger biplanes were placed in service on the European lines. These machines are, so far as the wings, tail-unit, and engine installation are concerned, identical with the "Scipio" class of flying-boat, three of which are operating on the Mediterranean section of the Empire routes. The chief modifications are the substitution of a fuselage and undercarriage for the hull and wing-tip floats. The all-up weight and performance of the two types of machine are approximately the same.

A number of De Havilland "Express Air Liners" were also ordered, five of them being for Qantas Empire Airways, with which Imperial Airways is associated, for the Singapore-Brisbane section of the England-Australia air route.

This article may be completed with brief descriptions of some recent British commercial aircraft.

#### AIRSPED "ENVOY."

A twin-engined passenger- or freight-carrying monoplane, designed and built by Airspeed (1934), Limited, Portsmouth, is a scaled-up version of the same company's single-engined "Courier," and incorporates most of the features which made this earlier machine one of the outstanding of the smaller British commercial aircraft produced in recent years. The "Envoy" provides standard accommodation for a pilot and 6 passengers, complete with lavatory and outside baggage compartment. On a total loaded

weight of 5,300 lb. it has a pay-load of 1,396 lb. and a range of 200 miles. With two 185-h.p. Wolseley A.R.9 radial air-cooled engines the maximum speed is 170 m.p.h. at sea-level, 165 m.p.h. at 5,000 ft., and 159 m.p.h. at 10,000 ft. At a cruising speed of 150 m.p.h. the fuel consumption is 21 gallons an hour. The machine will maintain a height of 1,000 ft. at 5,200 lb. loaded weight with one engine completely stopped. An important feature of the machine from the operating point of view is that it combines a high cruising speed with low fuel consumption. This has been achieved by clean design and the use of a retractable undercarriage.

A special version of the "Envoy," known as the "Viceroy," was produced to compete in the air race from England to Australia. Although thus specially conceived the "Viceroy" retains all the features which will suit it to commercial work. In general design it very closely resembles the "Envoy," but is fitted with two 315-h.p. Siddeley "Cheetah" engines supercharged to give their maximum power at 7,000 ft. Carrying a crew of 2 and with sufficient fuel for a range of about 1,400 miles it has a maximum speed of 210 m.p.h. at 7,000 ft. For commercial purposes similar accommodation to that provided in the "Envoy" would be available, and in that form the "Viceroy" would have a cruising speed of about 190 m.p.h.

#### AVRO DESIGNS.

A commercial aeroplane recently produced by Messrs. A. V. Roe & Co., Newton Heath, Manchester, is a high-wing cantilever monoplane of quite considerable capacity and performance, capable of unusually economical operation. It can be fitted with either two 460-h.p. Siddeley "Jaguar" or four 215-h.p. Siddeley "Lynx" engines. Accommodation is provided for a crew of 2 and a maximum of 16 passengers, but the number carried depends on the requirements of the operator and the engines used.

With two "Jaguar" engines and on a gross loaded weight of 11,791 lb. the Avro 642, as it is named, carries a pay-load of 2,960 lb. and has a maximum speed of 160 m.p.h. at sea-level, 154 m.p.h. at 5,000 ft., and 149 m.p.h. at 10,000 ft. The cruising speed at 1,000 ft. is 135 m.p.h., and at this speed the tested fuel consumption is 48 gallons an hour, which gives a range of 300 miles in still air. With the standard fuel tanks filled to capacity the range can be extended to 600 miles, but the number of passengers would have to be reduced from 16 to 12. With four "Lynx" engines the gross loaded weight is 11,800 lb. and the pay-load (14 passengers and baggage) 2,580 lb. The maximum speed is 150 m.p.h. and the cruising speed 127 m.p.h. The fuel consumption at cruising speed is 44 gallons an hour and the range 345 miles.

The Avro 652 is a twin-engined 8-passenger cabin monoplane ordered by Imperial Airways. Unlike previous Avro productions, it is a low-wing cantilever monoplane with retractable undercarriage. With two 270-h.p. Siddeley "Cheetah" engines its maximum speed is 175 m.p.h., its cruising speed 150 m.p.h., and

its range 475 miles. On a loaded weight of 6,600 lb. the useful load (crew of one, eight passengers, and baggage) is 2,400 lb.

#### DE HAVILLAND TYPES.

The "Dragon-Six" was produced in 1934 as a special high-performance model of the well-known "Dragon" light twin-engined commercial biplane which was brought out by the De Havilland Aircraft Company in 1933. The "Dragon" is remarkable for its high load-capacity in relation to horse-power and its low first, maintenance, and operating costs, and these features are retained in the "Dragon-Six" with the added advantage of increased performance.

In general arrangement the two machines are similar, but the "Dragon-Six" has tapered wings of high-aspect ratio, cleaner engine nacelles into which the two units of the divided under-carriage are faired, and two 200-h.p. De Havilland "Gipsy-Six" engines in place of the 130-h.p. "Gipsy-Major" engines of the "Dragon." The increase of horse-power and the improved aerodynamic design result in the "Dragon-Six" having a maximum speed of 165 m.p.h. at 1,000 ft., and a cruising speed of 140 m.p.h., as compared with 134 m.p.h. maximum and 114 m.p.h. cruising of the "Dragon." On a maximum loaded weight of 5,000 lb. it can carry a useful load of 1,300 lb. and its range is 590 miles in still air. The fuel consumption at cruising speed is 19 gallons an hour.

The machine may be supplied with a variety of cabin furnishings for any number of passengers ranging from 4 to 10, or the space may be used for freight-carrying. The standard model, to which the above performance figures apply, has accommodation for pilot and 6 passengers, baggage, and enough petrol for 590 miles.

A military version of the "Dragon" has been produced and supplied to the Iraq Air Force and the Danish Army Air Service. In this version it can be arranged to carry an armament of 8 machine guns, bombs, camera, wireless, message picking-up apparatus, etc. Accommodation is also provided in the cabin for troop-carrying or for the carriage of 4 full-sized service stretchers.

As a reconnaissance aircraft the "Dragon" is arranged for a crew of 3 with sufficient petrol for a range of 730 miles. The armament consists of one fixed Lewis gun firing forward and operated by the pilot, and 2 Lewis guns firing aft through ports in the roof and floor of the cabin. Wireless, camera, message picking-up gear, emergency rations and drinking-water, etc., are also carried. As a bomber the machine carries the same equipment except for the camera. Petrol for a range of 600 miles is provided, and 16 20-lb. bombs are carried in racks beneath the fuselage. As a troop-carrier the machine is stripped of all armament, and folding seats are provided for 5 fully armed men. Wireless, message picking-up gear, and emergency drinking-water are carried.

The military "Dragon" is particularly suitable for small air forces which are chiefly intended for policing duties and are not likely to meet much opposition from the air. Its versatility,

coupled with its low first cost and economy of operation and maintenance, makes it eminently suitable for such forces by enabling a number of essential military duties to be performed by one type of machine.

A military version of the "Dragon-Six" is to embody the armament and equipment as described for the "Dragon," but will have a greatly improved performance. Actually the performance of the military "Dragon" and "Dragon-Six" are similar to those of the civil versions previously mentioned.

The De Havilland 86, or "Express Air Liner," was designed to a specification which complied to the conditions of the Australian Government for the extension of the Empire air route from Singapore to Brisbane. It is an enlarged version of the "Dragon" with 4 De Havilland "Gipsy-Six" engines, and a large cabin which can be furnished with a number of alternative arrangements giving seats for from 8 to 16 passengers. The standard version has eight seats, lavatory, and baggage compartment. With an empty weight of 5,637 lb. the disposable load is 4,363 lb. and the loaded weight 10,000 lb. Allowing for a crew of 2, petrol and oil for 485 miles, wireless, etc., the pay-load is 2,667 lb. At this loading the maximum speed is 170 m.p.h. at 1,000 ft. and the cruising speed 145 m.p.h. The machine will maintain height with full load with any two of its four engines out of action.

Although built purely as a racing machine to compete in the air race from England to Australia, the De Havilland "Comet" deserves mention because of the commercial significance of its remarkable accomplishment in flying from Mildenhall, Suffolk, to Melbourne, a distance of 11,300 miles, in less than three days. It is a low-wing cantilever monoplane with two special De Havilland "Gipsy-Six" engines, each developing 230 h.p., and a retractable undercarriage. Carrying a crew of 2 and 258 gallons of petrol it has a maximum speed of 235 m.p.h. and a range of 2,900 miles. In its racing form no provision is made for carrying any useful load, but the design could be suitably modified to produce a high-performance mail-carrying aeroplane of a type which has been sadly neglected in British commercial aviation. The achievement of the "Comet" has undoubtedly had a far-reaching effect in drawing attention to the need of an accelerated Empire air-mail service, and in this respect the enterprise of the De Havilland Aircraft Company in designing and building three machines of this type in the short period of eight months, with a guarantee that if the designed performance was not attained the purchase prices would be returned, is deserving of the highest praise.

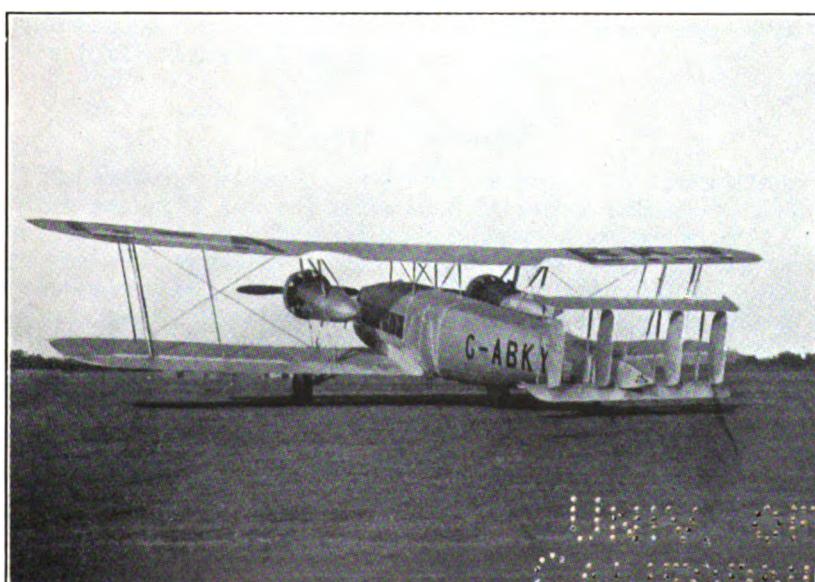
#### SHORT "SCION."

The Short "Scion" is a low-powered, light transport monoplane intended primarily for small aircraft operators, for special charter work, or for use on feeder lines to the main air routes. With two 90-h.p. Pobjoy "Niagara" engines it has a maximum weight of 3,000 lb. which, with full tanks, gives a pay-load (pilot and 5



(*"Flight" Photograph.*)  
**THE AIRSPEED ENVOY MONOPLANE.**

(*Builders, Airspeed (1934), Ltd., Portsmouth.*)



**THE VICKERS VELOX BIPLANE.**

(*Builders, Vickers (Aviation), Ltd., Weybridge.*)

NO. 1000  
ANAGORILLA

passengers) of 1,040 lb. With this loading the machine has a maximum speed at ground-level of 121 m.p.h., a cruising speed of 98 m.p.h., and a range at cruising speed of 370 miles.

#### MONOSPAR ST 10 AND 11.

The Monospar ST 10 and 11, which are identical except that the former has a fixed undercarriage and the latter a retractable type, are to be placed in a similar category to that of the Short "Scion." The Monospar is a low-wing cantilever monoplane with accommodation for pilot and 3 passengers. Its most interesting feature is that it incorporates the patented "Monospar" system of construction, the application of which enables the structure weight to be very considerably reduced. For commercial aircraft an increase in pay-load of approximately 30 per cent. is made possible by the use of the patented "Monospar" wing construction.

The ST 10, the first example of which won the 1934 King's Cup Race at an average speed of approximately 136 m.p.h., has two 90-h.p. Pobjoy "Niagara" engines, and carrying a pilot and 3 passengers, fuel and oil for a range of 585 miles, baggage, etc., has a maximum speed of 142 m.p.h., and a cruising speed of 130 m.p.h. The tare weight is 1,470 lb., and the loaded weight 2,550 lb. The ST 11 has the same accommodation, but several slight changes in weight and performance follow the use of a retractable undercarriage. This fitting increases the tare weight to 1,524 lb., but the loaded weight remains the same as for the ST 10. The retractable undercarriage results in the maximum speed being increased to 155 m.p.h., and the cruising speed to 142 m.p.h.

#### VICKERS "VELLOX."

The Vickers "Vellox" provides the one and only example of a British aeroplane designed to be used for either military or civil purposes. It is a twin-engined cabin biplane following very closely the line of development in weight-carrying aeroplanes pursued by Vickers (Aviation), Limited, over a period of years. The cabin has a total capacity of 485 cu. ft. and provides ample room for seating 12 passengers when equipped as a commercial machine, or 18 fully armed troops when used as a troop-carrier. All the furnishings of the cabin are quickly removable, so that the machine may be used as a freight-carrier. Immediately below the pilot's seat there is a prone bombing position, and bomb-rack attachment points are located on the underside of the fuselage. Extra large doors are provided to the cabin so that bulky freight may be easily loaded. The tare weight of the machine is 8,150 lb. and the loaded weight 18,500 lb., of which 8,063 lb. is available for crew and pay-load and 2,287 lb. for petrol and oil.

LEONARD BRIDGMAN.



## **NAVAL REFERENCE SECTION.**



## STATEMENT TO ACCOMPANY NAVY ESTIMATES, 1934.

THE net total of the Navy Estimates for 1934 is £56,550,000, and exceeds the net total for 1933 by £2,980,000.

Of this increase, £1,426,860 is required under Votes 8 and 9 in order to make normal progress with New Construction; there is a rise of £201,300 in the Non-Effective Votes, which is almost wholly automatic; an increase of £249,000 in the expenditure on the Fleet Air Arm, for which it is proposed to provide two new Flights of Aircraft; and a rise of £1,102,840 in the provision for the maintenance of the Fleet, which is due chiefly to provision for large repairs and modernisation of certain Capital Ships in view of the prolongation of their lives by the London Naval Treaty, and also to replenishment of depleted stocks of stores, etc. It should be added that of the increased requirement for New Construction (£1,426,860), rather more than £1,000,000 results from the retardation of the 1931 Programme, to which I referred in my Statement accompanying the Navy Estimates of 1933.

An increase of slightly more than 2,000 in the personnel of the Fleet is provided for in Vote A. This will afford some relief to the drafting situation and enable better provision to be made for certain essential services.

The New Construction Programme for 1934 is as follows:—

- Four Cruisers (three of new "Minotaur" type and one of "Arethusa" type).
- One Leader and eight Destroyers.
- One Aircraft Carrier.
- Three Submarines (one Minelayer Submarine and two "S" or Patrol type).
- Two General Service Sloops.
- Two Sloop Minesweepers.
- One Netlayer.
- Two Coastal Sloops.
- One Surveying Ship.
- Small Craft.

Although the Programme for 1933 was the last one due for completion by the 31st December, 1936, under the London Naval Treaty, the building of new Cruisers, Destroyers and Submarines continues so be governed by the Treaty up to the 31st December, 1936. Until that date the British Commonwealth of Nations may only lay down, under the Treaty, replacement tonnage for Cruisers and Submarines becoming over-age before the end of 1939 and for Destroyers becoming over-age before the end of 1938, and these limitations have, of course, been kept in mind in fixing the new Programme.

It will be recalled that the 1933 Programme originally included four Cruisers, but that when in the course of the year it became necessary to modify that Programme, so as to provide for the construction of two Cruisers of a new and larger type, the Treaty limitation of replacement tonnage to be completed by the 31st December, 1936, made it necessary to omit the fourth Cruiser. The original position is now being restored by the addition of the fourth Cruiser to the Programme for 1934.

The numbers of Destroyers and Submarines are the same as in previous Building Programmes since the Treaty.

As in previous years, suitable allowance has been made for anticipated under-spending in contract work, etc.

B. EYRES MONSELL.

ADMIRALTY,  
March 1, 1934.

#### NOTES ON MATTERS OF GENERAL INTEREST.

##### VISIT OF H.R.H. PRINCE GEORGE TO AUSTRALIA.

In connection with the centenary celebration of the State of Victoria, H.R.H. Prince George will visit Australia in H.M.S. Sussex, returning after the celebration in an Australian cruiser. His Royal Highness will also pay a visit to New Zealand.

##### DISTRIBUTION OF THE FLEET.

###### BATTLESHIPS AND BATTLE CRUISERS.

The Barham, having completed modernisation and large repairs, has now joined the Home Fleet to take the place of the Warspite, which has been placed in Reserve and will be taken in hand for large repairs on April 1.

The Ramillies is still undergoing large repairs, and is expected to complete next August, when she will take the place of the Royal Oak in the Mediterranean Fleet. The latter vessel will be taken in hand for large repairs next July. The Malaya will also be taken in hand for modernisation and large repairs in the course of 1934: the work will occupy about two years for each ship.

Modernisation is limited to what is permitted by the Treaty of Washington.

The Repulse is in hand for large repairs at Portsmouth, and is expected to complete by April 1, 1936.

###### AIRCRAFT CARRIERS.

The Courageous remains with the Home Fleet. The Furious will be transferred from the Home to the Mediterranean Fleet during May, when the Glorious returns home for an extensive refit which will be completed in 1935. The Hermes, which is undergoing large repairs, will relieve the Eagle on the China Station before the end of the present year. The latter ship will then return to the Mediterranean, and the Furious will rejoin the Home Fleet.

The Argus remains in Reserve.

###### CRUISERS.

The Achilles, Orion, and Neptune have commissioned for service in the 2nd Cruiser Squadron, Home Fleet. This squadron now consists of four cruisers of the 1929 and 1930 Programmes, with the Leander as Flagship.

During the past year the Dorsetshire has replaced the Cardiff as Flagship on the Africa Station, and the Exeter and York have replaced the Durban and Dauntless in the South American Division of the America and West Indies Squadron.

The Hawkins, Flagship on the East Indies Station, which is due to be scrapped in 1935 or 1936, will be relieved by the Norfolk, at present Flagship on the America and West Indies Station, about March, 1935. The Norfolk will be relieved by the York, which in turn will be relieved by the Ajax, one of the Cruisers of the 1931 Programme. On return to Home Waters, the Hawkins will probably join the Reserve.

The Emerald will complete large repairs in July, and will then return to the East

Indies Station. The Enterprise will then return home to be taken in hand for large repairs.

The Caradoc will be relieved in China in the summer by the Capetown, which has lately completed large repairs; on return to Home Waters, the Caradoc will reduce to Reserve. The Cumberland will be taken in hand for large repairs on returning from the China Station early in 1935.

#### LEADERS AND DESTROYERS.

The vessels of the 1930 Programme, viz., the Leader Duncan and eight destroyers of the "Defender" Class, have been completed, and have joined the Mediterranean Fleet.

The vessels of the 1931 Programme, viz., the Leader Exmouth and eight destroyers of the "Eclipse" Class, will replace older vessels in the Home Fleet in the autumn of 1934.

The vessels of the 1932 Programme, viz., the Leader Faulknor and eight destroyers of the "Fearless" Class, have been laid down, and will replace older vessels in the Home Fleet early in 1935.

#### SUBMARINES.

The Second Submarine Flotilla, Home Fleet, and the Fourth Submarine Flotilla, China Station, have been maintained at the same strength as in 1932. The First Submarine Flotilla, Mediterranean Fleet, has been increased, by the addition of the Thames, to seven submarines.

#### SLOOPS.

The new sloops Grimsby, Leith, Lowestoft, and Wellington will shortly replace older sloops abroad.

The Lupin, which has been reconditioned, has joined the East Indies Squadron in place of the old special service vessel Triad, which has been sold.

The Bridgewater will be transferred from the China Station to the Africa Station during the latter part of 1934.

The netlayer Guardian, which is fitted also for duty in the Fleet Target Service, has completed special trials, and joined the Home Fleet.

The four Sloop Minesweepers of the 1931 and 1932 Programmes, completing in 1934, will be allocated to Home waters in lieu of vessels to be scrapped or placed in Reserve.

The Cornflower, which is shortly to be removed from the active list, is being lent to the Government of Hong Kong for service as Drill Ship of the local R.N. Volunteer Defence Force.

#### GUNBOATS.

The Sandpiper has joined the Yangtse Flotilla on the China Station. The Robin will shortly join the West River Flotilla. Work is being done on the gunboats of the "Insect" Class, in China, to extend their lives for a further eight to ten years.

#### MINELAYER.

The Adventure has been transferred from Home waters to the China Station.

#### TARGET SHIP.

The target ship Centurion has been employed both at home and in the Mediterranean and has been of great value for the gunnery training in both Fleets. In September last, she was lent to the Royal Air Force for training purposes; it is proposed to make similar arrangements during the present year, and also to place the vessel at the disposal of the military authorities at some convenient period for Coast Defence training.

#### CO-OPERATION WITH THE DOMINIONS, ETC.

##### THE COMMONWEALTH OF AUSTRALIA.

A Leader and four Destroyers of the "W" Class have been lent to the Australian Government to replace the Leader Anzac and five older Destroyers, which will in due course be scrapped.

The visit of the cruiser Sussex to Melbourne in connection with the Victoria Centenary in 1934 is being made the occasion of a resumption of the practice of exchanging cruisers between the Royal Navy and the Royal Australian Navy, the Sussex remaining about a year in Australian waters, and being replaced during that period by an Australian cruiser.

#### THE DOMINION OF NEW ZEALAND.

The two sloops Veronica and Laburnum, employed on the New Zealand Station, will be relieved by the new sloops Leith and Wellington before the end of the forthcoming financial year.

#### THE UNION OF SOUTH AFRICA.

The reorganisation of the South African Naval Service was the subject of discussion with the Government of the Union in the summer of 1933.

A scheme of training is now under consideration which will maintain the efficiency of the South African Royal Naval Volunteer Reserve, and afford increased opportunities for co-operation with H.M. ships on the Africa Station.

#### THE EMPIRE OF INDIA.

A new sloop Indus is under construction for the Royal Indian Marine.

#### COLONIAL ROYAL NAVAL VOLUNTEER RESERVES.

Active steps are being taken to promote the formation and training of local Royal Naval Volunteer Reserve divisions in the several Colonies. Satisfactory progress has been made in the Straits Settlements, Hong Kong, Kenya, and the West African Colonies.

#### FLEET ACTIVITIES ABROAD.

##### HOME FLEET.

The York visited Helsinki from September 3 to 10, 1933, during the "British Week" in Finland. Her visit was much appreciated, and contributed greatly to the success of the week.

During February, 1934, a part of the Home Fleet under the Commander-in-Chief, Admiral Sir William Boyle, K.C.B., visited the British West Indies.

##### MEDITERRANEAN FLEET.

In September, 1933, the Ceres attended the Spetsai centenary celebrations of the Greek Union.

On October 21, the Commander-in-Chief of the Mediterranean Fleet personally presented memorials of the Order of St. Michael and St. George for preservation in the throne room of the Palace of Corfu.

The Hastings attended the opening of the harbour of Haifa on October 31.

##### RED SEA AND PERSIAN GULF.

The usual anti-slavery patrols by two sloops have been carried out without incident in the Red Sea.

During the winter months, the Resident at Aden and the mission to the Imam of the Yemen were conveyed to Hodeida by H.M. ships.

In September, 1933, the First Destroyer Flotilla was detached from the Mediterranean Fleet for cruise in the Persian Gulf. The object of the cruise was to show the flag, and to further our friendly relations, particularly with the Sheiks on the Arab coasts, who are in special Treaty relationships with His Majesty's Government.

#### AMERICA AND WEST INDIES.

A cruiser was held in readiness at Kingston, Jamaica, from September to November, 1933, in case assistance should be required to protect British lives and property during the revolution in Cuba.

##### CHINA.

The Commander-in-Chief of the China Station, and a number of H.M. ships, visited Japan during the autumn, and were cordially received.

During the year, China has continued to experience civil disturbances, incidents of banditry and piracy, and communistic risings.

H.M. ships have been stationed throughout the year at coast and river ports to safeguard British interests, and vessels have been despatched to various localities where outbreaks have occurred, notably to Foochow in August and November, and also to Wanhsien, Amoy, Chinwangtao, and Newchwang : the visit to the last-named place was in connection with the abduction of the officers of the ss. Nanchang.

H.M. ships have also given assistance on the occasions of the wreck of the Norwegian vessel ss. Suzanne, the piracy of the ss. Prominent and San Hsing, and the groundings of the ss. Hsin Chang Wo and Antung.

When the disturbance at Foochow, caused by the revolt of the troops in the Fukien province, threatened to develop, the Verity, Whitehall, and Wild Swan were despatched to protect shipping, and the Berwick was sent to the entrance of the Min River, in case it became necessary to evacuate British subjects. The Cornflower was also sent to Amoy in the Fukien province, and other vessels were held in readiness at Hong Kong.

The anti-piracy patrol off the Bias Bay coast has been maintained, and acts as a deterrent to piracy in this notorious area.

#### HYDROGRAPHY.

During 1933, H.M. Surveying Ships have been fully employed in making new surveys or re-surveys as necessary : four ships have been employed at home and four abroad. Of the latter, one has been employed in the Far East, one in Palestine and the Indian Ocean, one in the Persian Gulf and Cyprus, and one (the Challenger) in the West Indies and on the coast of Labrador. The open season in Labrador is short, and in order to make as rapid progress as possible a small party of officers and ratings from the Challenger has been left at Nain to continue surveying during the winter months.

A Tidal Stream survey of the British Isles has been commenced, and the collaboration of the French Government has been obtained for observations near the French coast ; the survey will take about four years to complete.

Echo sounding continues to be developed with very promising results, and several improvements have been effected. Further developments in the shallow water echo apparatus are nearing perfection. The introduction of a recorder is a considerable advance on the aural method, especially for surveying, and depths from 4 feet to 4,000 fathoms have been recorded. During the past year, eight ships have been fitted with the navigational set. One surveying ship and a cruiser have been fitted with special deep-water sets.

On January 1, 1934, the Admiralty assumed sole responsibility for the publication of Notices to Mariners both for the Fleet and also for the Mercantile Marine : the Board of Trade have thus been relieved of the necessity of providing information for the use of the Mercantile Marine, and a considerable economy has been effected.

#### METEOROLOGY.

In collaboration with the Air Ministry, progress continued to be made during 1933 in the development of Fleet Meteorology, the improvement of meteorological instruments for the use of the Fleet Air Arm and H.M. ships generally, and the collection of meteorological data.

#### NAVIGATION.

H.M. ships continue to co-operate in the improvement of navigational aids and equipment.

Investigations are being carried out into methods of determining more accurately than hitherto the speed of ship through the water.

The International Convention for the Safety of Life at Sea, 1929, prescribed New Regulations for Preventing Collisions at Sea. These have not yet been ratified by all the Powers signatory to the Convention, but in anticipation of the operation of the Regulations in the near future, some of the smaller and auxiliary vessels of the Fleet have been fitted with a second navigational steaming light : this has necessitated, in some ships, the fitting of a second mast.

A year's experience has been gained with the new Steering Orders, which may now be considered as satisfactorily established.

#### FISHERY PROTECTION.

The work of the Fishery Protection and Minesweeping Flotilla in protecting and assisting the fishing fleets and in training Reserve Officers and men in minesweeping, has continued.

During the past year the Captain commanding the Fishery Protection and Mine-sweeping Flotilla visited Iceland and the Faroe Islands in the Harebell. Visits to these islands were also paid by the Godetia, Cherwell, and Boyne.

#### CO-OPERATION BETWEEN THE SERVICES.

Combined operations with the Military and Air Forces have been held both at home and abroad, and the usual exercises between the Staff Colleges of the three Services have also taken place.

A combined exercise, in which some important units of the Royal Navy and Royal Air Force took part, was carried out in September, 1933. The operations did not aim at simulating war conditions, but at familiarising Royal Air Force personnel with the general conditions of naval attack.

It is proposed in September, 1934, to carry out on the east coast of England a combined landing exercise, in which the Home Fleet will take part with Army and R.A.F. units.

#### NAVAL AIR WORK.

The development and fitting of catapults for launching aircraft is proceeding steadily, and new ships are being fitted as they commission for service. A satisfactory design for fitting on the turrets of capital ships has now been developed and tested, and the type is being fitted as opportunity arises. Twenty-one capital ships and cruisers are now fitted. The experimental work in the Ark Royal has been continued with valuable results.

The replacement of obsolete single-seater Fighter and three-seater Spotter Reconnaissance types is being continued. The re-engining of the more recently introduced Torpedo Bombers is being continued, and the replacement of the older type is almost complete.

The equipment of capital ships and cruisers with aircraft, and the completion of the existing Carriers (except those in Reserve) to their normal number of aircraft, are being proceeded with.

In future, the provision of new aircraft required for new cruisers will be brought into direct relation with the cost of the ships for which they are intended, by including their cost in the cost of new construction in the same way as the cost of guns, torpedoes and the first equipment of ammunition is already included.

The total number of Pilots trained is now one hundred and thirty-seven, and the number under training is sixteen. The number of trained Observers is eighty-six, and nine Officers are under training as such.

#### PERSONNEL.

Progress in the tactical training of the Fleet has been satisfactory.

On the conclusion of the cruise of part of the Home Fleet to the West Indies, the Home and Mediterranean Fleets are taking part in combined exercises, which are being resumed on their full scale after an interval of two years.

The instructions issued to the Fleet to ensure that sufficient attention is given to the individual training of the personnel and the development of initiative and power of command have had very satisfactory results.

With the object of giving more opportunity for the proper development of powers of leadership and the assumption of responsibility by Officers and Petty Officers, the peace complements of certain large ships have been reduced, and trials are now being carried out in a battleship to ascertain the minimum number of Lieutenant-Commanders and Lieutenants adequate to man the ship under peace conditions.

The Frobisher has continued service as a sea-going training ship for Naval Cadets, those from Dartmouth and those of the Accountant Branch being appointed for two cruises and those from the Special Entry for three. This system of training is proving very satisfactory.

New Regulations have been approved for the Physical and Recreational Training Branch, with the object of giving a larger number of general service officers a knowledge of recreational training, and of so reducing the number of officers employed exclusively in this special work.

The introduction of Squadron Boards to replace (as explained in the notes accompanying the 1933 Estimates) the Ship Boards which previously examined Leading Seamen for promotion to the rating of Petty Officer, has added prestige to this rating, and is resulting in a higher standard.

Recruiting continues to be satisfactory.

A larger proportion of Short Service Seamen is being entered than hitherto. This has the advantages of enabling the necessary increase in Seamen to be achieved without undue strain upon the existing Training Establishments, and of improving the proportion of Long-Service Able Seamen who can become Leading Seamen or Petty Officers. It has the further advantage of increasing our trained Reserves.

After review by an Admiralty Committee, the conditions of service and remuneration of the Signal and Telegraphist Branches have been placed on a basis which recognises the increased importance of their work. The institution of a system of non-substantive pay has placed them, as regards prospects, on a level with men of the Seamen Branch who specialise (for example) in Gunnery or Torpedo.

The entry of a proportion of Short-Service Telegraphists, which was instituted in 1932 and has proved satisfactory, is being continued. A similar system for Signal Ratings was instituted in 1933.

#### MATERIAL. NEW CONSTRUCTION.

##### CRUISERS.

###### 1929 Programme.

The Leander, the first of a new class of 6-inch gun cruisers, completed trials and was commissioned at Devonport on March 23, 1933.

###### 1930 Programme.

The Achilles was completed by Cammell Laird and Company, Limited, Birkenhead, and commissioned at Chatham on October 10, 1933. The Orion, built at Devonport, and the Neptune, built at Portsmouth, successfully completed trials and were commissioned on January 16 and February 22, 1934, respectively.

###### 1931 Programme.

The Ajax, of the "Leander" Class, which is being built by Vickers-Armstrongs, Limited, Barrow-in-Furness, is to be launched to-day, and is due to complete in April, 1935.

The Amphion, the first of the "modified Leander" Class, was laid down at Portsmouth Dockyard on June 26, 1933, and is expected to be launched in July, 1934.

The Arethusa, the first of a class of smaller 6-inch gun cruisers of about 5,200 tons, is under construction at Chatham Dockyard, and will be launched on March 6, 1934.

###### 1932 Programme.

The Phaeton was laid down at Swan, Hunter and Wigham Richardson's works, Wallsend-on-Tyne, on July 8, and the Apollo at Devonport Dockyard on August 15, 1933. Both these vessels are of the "modified Leander" type. The Galatea, the second of the "Arethusa" type, is under construction at Scott's Shipbuilding and Engineering Company, Limited, Greenock. The construction of all three vessels is proceeding normally, and they will be launched during the summer of 1934, with a view to completion in 1935.

###### 1933 Programme.

Orders for the two new-type cruisers of about 9,000 tons, the Minotaur and Polyphemus, which are to be built by contract, will be placed about June, 1934.

The order for the construction of the Penelope, a third cruiser of the "Arethusa" Class, is being placed with Harland and Wolff, Limited, Belfast.

#### FLOTILLA LEADERS AND DESTROYERS.

##### 1930 Programme.

The Flotilla Leader Duncan was completed at Portsmouth Dockyard on March 31, 1933.

###### 1931 Programme.

The Flotilla Leader Exmouth was laid down at Portsmouth Dockyard on May 15, 1933, and is due to complete about the end of October, 1934. The eight destroyers of the "Eclipse" Class, which are being built by contract, viz. the Eclipse, Echo, Electra, Encounter, Escapade, Escort, Esk and Express, are well advanced, and should complete and pass into service in the autumn of 1934.

###### 1932 Programme.

The Flotilla Leader Faulknor, and eight destroyers of the "Fearless" Class, viz. the Fearless, Foresight, Foxhound, Fortune, Forester, Fury, Fame, and Firedrake, which are being built by contract, are making satisfactory progress. These vessels are due to complete towards the end of the financial year 1934.

###### 1933 Programme.

An order for the construction of the Flotilla Leader Grenville will shortly be placed with Yarrow and Company, Limited, Scotstoun. Orders for the eight destroyers will shortly be placed as follows :—

Greyhound and Griffin	.. Vickers-Armstrongs, Limited, Barrow-in-Furness.
Garland and Gipsy	.. Fairfield Shipbuilding and Engineering Company, Limited, Govan.
Gallant and Grenade	.. A. Stephens and Sons, Limited, Linthouse, Govan.
Grafton and Glowworm	.. J. I. Thornycroft and Company, Limited, Southampton.

**SUBMARINES.****1930 Programme.**

The Porpoise, a minelaying submarine, built by Vickers-Armstrongs, Limited, Barrow-in-Furness, passed into service in March, 1933. The Seahorse and the Starfish, of the "Swordfish" Class, passed into service after successful trials in October, 1933.

**1931 Programme.**

The Severn, a sister vessel of the Thames, was launched at the works of Vickers-Armstrongs, Limited, Barrow-in-Furness, on January 16, 1934, and is expected to complete in September, 1934. The Shark, a vessel of an improved "Swordfish" Class, under construction at Chatham Dockyard, was laid down on June 12, 1933, and is expected to complete about December, 1934. The Sealion, a sister vessel of the Shark, was laid down on May 16, 1933, at the works of Cammell Laird and Company, Limited, Birkenhead, and is expected to complete about the end of October, 1934.

**1932 Programme.**

The Clyde (a sister vessel of the Thames and Severn), which is being built at Barrow-in-Furness by Vickers-Armstrongs, Limited, will be launched on March 15, 1934, and is expected to complete about December, 1934. Owing to certain changes in design, the construction of the Grampus, a minelaying submarine, at Chatham Dockyard, was deferred, and the Snapper, a submarine of the improved "Swordfish" Class, was substituted for her. The Snapper was laid down on September 18, 1933, and is due to complete in the summer of 1935. The Salmon, also of the improved "Swordfish" Class, was laid down on June 15, 1933, at the works of Cammell Laird and Company, Limited, Birkenhead, and is expected to complete about December, 1934.

**1933 Programme.**

The minelaying submarine Grampus, deferred from the 1932 Programme, will be built at Chatham Dockyard, and orders have been issued for her construction to commence to-day. The order for a further vessel of this class, the Narwhal, is being placed with Vickers-Armstrongs, Limited, Barrow-in-Furness, and the order for a vessel of the improved "Swordfish" Class, the Seawolf, with Scott's Shipbuilding and Engineering Company, Limited, Greenock.

**SLOOPS.**

Two sloops of the 1931 Programme, the Grimsby and Leith, were launched at Devonport on July 19 and September 9, 1933, respectively. The construction of these vessels is progressing satisfactorily : the former is due to complete in May, 1934, and the latter in July, 1934.

The two sloops of the 1932 Programme, the Lowestoft and Wellington, were laid down at Devonport on August 21, 1933, and September 25, 1933, respectively : the Lowestoft is due to complete in November, 1934, and the Wellington in January, 1935.

The order for the building of the Deptford, a sloop of the 1933 Programme, at Chatham Dockyard, was placed on January 8, 1934, and the construction of the second sloop of that programme, the Londonderry, will commence at Devonport Dockyard to-day.

The two sloop minesweepers of the 1931 Programme, the Halcyon and the Skipjack, were launched on December 20, 1933, and January 18, 1934, respectively. They are due to complete in May, 1934.

The two sloop minesweepers of the 1932 Programme, the Harrier and Hussar, were laid down on July 11, 1933, and August 10, 1933, and are expected to complete in September, 1934, and October, 1934, respectively.

The order for the Speedwell, a sloop minesweeper of the 1933 Programme, is being placed with William Hamilton and Company, Limited, Port Glasgow.

The order for the convoy sloop of the 1933 Programme, the Bittern, was placed with John Brown and Company, Limited, Clydebank, on October 5, 1933, and the vessel will be laid down shortly. The order for the coastal sloop of the 1933 Programme, the Kingfisher, was placed with the Fairfield Shipbuilding and Engineering Company, Limited, Govan, on December 15, 1933.

#### DEPOT SHIP FOR DESTROYER FLOTILLA.

The Woolwich (1932 Programme) was laid down at the works of the Fairfield Shipbuilding and Engineering Company, Limited, on May 29, 1933, and construction is proceeding normally. The vessel is due to complete in October, 1935.

#### MISCELLANEOUS.

The Aldgate (1932 Programme) and the Watergate (1933 Programme), Boom Gate Vessels, are expected to complete towards the end of March, 1934. The Elfin, Tender for the Submarine Depot, Portland, and the Redwing, Tender for the Torpedo School, Devonport (1932 Programme), built by J. S. White and Company, Limited, were delivered on January 12 and 20, 1934, respectively.

A trawler has been purchased, and converted into a Boom Working Vessel, with the name of Fastnet.

The tug Imara has been purchased from the Government of Tanganyika, refitted, renamed Perseverance, and brought into service at Chatham to replace the tug Advice.

#### NAVAL WORKS.

The principal new works for which provision is made comprise certain storage accommodation for oil fuel, and improved storage, required for reasons of safety, at one of the Naval Armament Depots. Provision is made also for a Boom Defence Depot at Trincomali, a new Shipfitting Shop at Malta, and a new swimming bath for the Training Establishment at Shotley.

Work upon the Naval Base at Singapore is proceeding satisfactorily.

The work covered by the Jackson contract having reached a stage necessitating a further decision as to future progress upon the Base, the position has been reviewed somewhat in advance of the date mentioned in the announcement made by the then Government in 1930 (see the Statement Explanatory of the Navy Estimates, 1931, page 7).

It has been decided that, in order to secure the most economical results, it is important that there should not be any break in the continuity of the work necessary to enable the Base to function, and that provision should be made accordingly in these and subsequent Estimates.

In consequence of this decision, the details of the "Truncated Scheme" (by which the more essential portions of the full scheme were detached and made the subject of a revised estimate in 1926), have been reviewed and in some respects revised. The total estimate for the Naval Base Item as now revised is £8,693,000, as compared with the previous estimate of £7,750,000 for the "Truncated Scheme."

#### MISCELLANEOUS.

The administrative reorganisation effected in 1932, when the Department of the Accountant-General of the Navy was merged with that of the Secretary of the Admiralty, is working smoothly, and has resulted both in increased efficiency and in economy.

The new Royal Hospital School at Holbrook, Suffolk, which has replaced the Royal Hospital School at Greenwich, was occupied on April 27, 1933. The School received the honour of a visit by H.R.H. the Prince of Wales on July 26.

The process of substituting Royal Marine Police for Metropolitan Police in the Dockyards and other Establishments reached a farther stage in August, 1933, when the duty of policing Portsmouth Dockyard was taken over. It will be completed during 1934 by the transfer of the Police duties at Devonport Dockyard.

The reorganisation of the financial system of the Dockyards on the lines recommended by Mr. R. S. Hilton's Committee has now been carried out at all the Home Dockyards, and at Malta and Gibraltar. Preliminary steps are being taken to effect similar changes at Hong Kong, Bermuda, and Simonstown.

Developments in steam generating plants have been kept under observation, trials of certain new types have been furthered, and experimental work on the standard

type of boiler and equipment has been continued at the Admiralty Experimental Station with the object of reducing weight and space requirements to meet the needs of contemporary designs.

Trials of various fuels and oil burning apparatus also continue at the Admiralty Experimental Station, including burning tests of fuel oil produced from coal; a certain quantity of this fuel has been used satisfactorily on service afloat.

Steady progress has been made at the Admiralty Engineering Laboratory in the development of high speed compression ignition engines for use in the Naval Service. In addition, close touch is being maintained with commercial progress in this direction, and a number of small ships, such as sloops, are now fitted with oil-driven electric generating sets of various makes. Experience with these has so far been satisfactory; they make it unnecessary to use steam when in harbour, and thus improve habitability in hot climates and at the same time result in fuel economy. The use of such engines is being extended to propelling units in the power-driven boats of H.M. ships, and all such boats of new ships will be so fitted, the use of petrol and paraffin, with the attendant risk of fire, being thus avoided.

## THE 1934 NAVAL CONSTRUCTION PROGRAMME.

### NAMES OF THE NEW WARSHIPS.

On November 30, 1934, an Admiralty communique stated that it had been decided that cruisers of the latest type (9,000 tons) shall be named after important cities, and accordingly the two vessels of that type included in the 1933 new construction programme have been renamed as follows: Minotaur, building at Messrs. Vickers-Armstrongs' on the Tyne, to be renamed Newcastle; Polyphemus, building at Messrs. John Brown's on the Clyde, to be renamed Southampton. The name "Southampton" has been substituted for "Minotaur" as the "class" name for vessels of this type.

The following names have been assigned to ships of the 1934 new construction programme:—

Name.	Builders.
Cruisers ("Southampton" Class).	
Glasgow . . . . .	Scott's Shipbuilding and Engineering Company, Limited, Greenock.
Sheffield . . . . .	Vickers-Armstrongs, Limited, Walker-on-Tyne, machinery at Barrow.
Birmingham . . . . .	Devonport Dockyard.
Cruiser ("Arethusa" Class).	
Aurora . . . . .	Portsmouth Dockyard.
Aircraft Carrier.	
Ark Royal . . . . .	By contract.
Flotilla Leader.	
Hardy . . . . .	Cammell Laird and Company, Limited, Birkenhead.
Destroyers ("Hero" Class).	
Hero . . . . .	Parsons Marine Steam Turbine Company, Limited, Wallsend-on-Tyne; hulls by Vickers-Armstrongs, Walker-on-Tyne.
Hereward . . . . .	
Hasty . . . . .	William Denny and Brothers, Dumbarton.
Havock . . . . .	
Hostile . . . . .	Scott's Shipbuilding and Engineering Company, Limited, Greenock.
Hotspur . . . . .	
Hunter . . . . .	Swan, Hunter and Wigham Richardson, Limited, Wallsend-on-Tyne.
Hyperion . . . . .	

Name.	Builders.
Minelayer Submarine ("Porpoise" Class).	
Rorqual . . . . .	By contract.
Submarines ("Swordfish" Class).	
Spearfish . . . . .	By contract.
Sunfish . . . . .	Chatham Dockyard.
Sloops ("Grimsby" Class).	
Aberdeen . . . . .	Devonport Dockyard.
Fleetwood . . . . .	}
Sloop Minesweepers ("Halcyon" Class).	
Niger . . . . .	By contract.
Salamander . . . . .	}
Coastal Sloops ("Kingfisher" Class).	
Mallard . . . . .	By contract.
Puffin . . . . .	}
Netlayer.	
Protector . . . . .	By contract.
Surveying Ship.	
Stork . . . . .	By contract.
Boom Gate Vessels.	
Dowgate . . . . .	By contract.
Ludgate . . . . .	}
Boom Working Vessel.	
Dunnet . . . . .	By contract.
Submarine School Tender.	
Dwarf . . . . .	By contract.
Trawler.	
Basset . . . . .	By contract.

## ABSTRACT OF NAVY ESTIMATES FOR 1934.

Votes.		Estimates 1934.		Estimates 1933.
		Gross Estimate.	Net Estimate.	Net Estimate.
		Maximum Numbers.	Maximum Numbers.	
<b>I.—NUMBERS.</b>				
A	Number of Officers, Seamen, Boys, and Royal Marines . . . . }	92,338	92,338	90,300
	Number of Royal Marine Police . . . . }	884	884	865
<b>II.—EFFECTIVE SERVICES.</b>				
1	Wages, etc., of Officers and Men of the Royal Navy, and Royal Marines, and Civilians employed on Fleet Services . . . . }	12,684,150	12,633,000	12,593,000
2	Victualling and Clothing for the Navy . . . . }	3,782,522	3,165,700	3,099,800
3	Medical Establishments and Services . . . . }	436,455	366,200	369,800
4	Fleet Air Arm . . . . }	1,338,000	1,338,000	1,089,000
5	Educational Services . . . . }	256,920	195,800	198,500
6	Scientific Services . . . . }	524,460	461,500	474,500
7	Royal Naval Reserves . . . . }	348,190	348,000	355,000
8	Shipbuilding, Repairs, Maintenance, etc.: . . . . }			
	Section I.—Personnel . . . . }	6,471,258	6,426,000	6,176,400
	Section II.—Materiel . . . . }	5,377,140	4,844,000	4,579,200
	Section III.—Contract Work . . . . }	9,442,000	9,407,500	7,635,700
9	Naval Armaments . . . . }	4,333,885	4,053,200	4,024,100
10	Works, Buildings, and Repairs at Home and Abroad . . . . }	2,489,800	2,277,000	2,184,300
11	Miscellaneous Effective Services . . . . }	663,200	603,300	560,000
12	Admiralty Office . . . . }	1,100,965	1,089,000	1,090,200
	Total Effective Services . . . . }	£ 49,248,945	£ 47,208,200	£ 44,429,500
<b>III.—NON-EFFECTIVE SERVICES.</b>				
13	Naval and Marine, Officers . . . . }	3,206,058	3,190,000	3,178,200
14	Naval and Marine, Men . . . . }	5,068,860	5,044,000	4,889,100
15	Civil Superannuation, Compensation Allowances, and Gratuities . . . . }	1,110,713	1,107,800	1,073,200
	Total Non-Effective Services . . . . }	£ 9,385,631	£ 9,341,800	£ 9,140,500
	<b>GRAND TOTAL . . . . }</b>	£ 58,634,576	£ 56,550,000	£ 53,570,000

NET INCREASE . . . . £ 2,980,000.

ADMIRALTY. 16 Feb., 1934	B. EYRES MONSELL, ERNE CHATFIELD, DUDLEY POUND,	CHARLES M. FORBES, GEOFFREY BLAKE, C. J. C. LITTLE,	STANLEY, EUAN WALLACE, O. MURRAY.
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STATEMENT SHOWING THE NUMBERS BORNE, THE EXPENDITURE ON NAVAL SERVICES FOR THE YEARS 1917 TO 1932, AND THE ESTIMATES FOR 1933 AND 1934.

( 205 )

YEAR	VOTE A. — Average number of borno. (a)	VOTE 1. — Wom. etc. Officer, etc. numbers borno.	VOTE 2. — Veter. Medical Establish. ments, etc. and Coching.	VOTE 3. — Civilian employed on Project Services	VOTE 4. — Civialian Medical Establish. ments, etc.	VOTE 5. — Educa. tional Services	VOTE 6. — Royal Scientific Services	VOTE 7. — Royal Naval Reserves	VOTE 8. — Shipbuilding, Repair, Maintenance, etc.		VOTE 9. — Naval Armament.	VOTE 10. — Naval Works.	VOTE 11. — Naval Amara. ments.	VOTE 12. — Admiralty Admiral. Office.	VOTE 13. — Admiralty Half Pay, etc.	VOTE 14. — Naval At. Pensions.	VOTE 15. — Civil Supreme Court, etc.	Balance Irrecover. able.	Total Expenditure	
									Section I. Personnel.											
									£	£	£	£	£	£	£	£	£			
1917	406,977	37,559,558	18,481,159	792,569	561,308	210,243	162,160	874,930	12,000,160	36,494,694	70,008,065	84,177,369	6,556,799	9,182,802	1,454,886	709,227	1,446,247	413,746	41,042	327,588,861
1918	381,311	46,373,612	21,219,351	1,158,287	491,270	247,922	262,886	871,970	15,037	763,559,128,675	94,248,874	64,886,784	10,928,241	9,357,552	1,985,804	704,914	3,738,778	445,495	28,090	334,001,227
1919	176,067	32,385,360	8,828,106	733,046	556,778	401,904	364,832	468,044	12,426,177	735,957	48,245,933	14,411,835	5,595,686	11,118,851	2,042,716	1,176,937	15,133,004	802,279	60,875	154,084,044
1920	124,009	21,314,380	8,311,708	683,830	769,110	505,152	249,185	359,864	12,006,747	6,798,906	12,001,446	8,488,961	4,982,968	5,724,974	2,352,344	4,847,476	580,906	23,611	92,505,320	
1921	127,180	19,220,859	6,831,481	645,735	480,243	405,892	359,575	423,056	10,690,188	8,835,771	4,834,336	6,253,468	4,746,485	3,506,514	1,790,641	2,002,921	3,881,863	1,020,693	69,935	75,986,141
										Credit 1.—										
1922	107,782	16,762,239	4,767,113	492,419	258,000	382,005	354,981	423,722	7,075,633	3,877,716	3,225,598	3,678,783	3,653,831	2,096,219	1,371,961	3,701,984	5,471,088	908,880	29,679	57,492,389
1923	99,107	14,175,111	4,153,803	410,842	188,793	330,644	379,084	459,391	6,751,496	5,521,386	4,427,874	3,840,800	3,215,766	982,173	1,247,813	9,866,704	4,280,246	823,340	33,864	54,064,350
1924	99,453	14,150,849	4,152,902	442,756	190,669	354,648	393,084	446,902	7,489,689	5,692,183	5,415,210	3,567,190	3,140,887	1,046,869	1,349,519	2,988,786	4,328,526	811,797	12,326	57,620,787
1925	100,224	14,576,469	4,226,570	440,209	327,226	417,562	405,114	7,929,269	6,305,184	6,398,406	4,247,113	2,422,050	836,119	1,307,700	2,812,350	4,449,585	928,396	8,110	60,004,548	
1926	100,791	14,322,678	4,236,846	484,919	681,000	324,036	393,839	444,769	7,487,962	5,422,141	7,275,173	5,685,087	2,108,441	930,368	1,293,639	2,914,419	4,450,140	894,472	23,002	57,142,962
1927	101,916	14,508,482	4,182,491	423,777	882,000	224,334	402,976	419,088	7,067,419	4,678,052	8,839,423	3,986,749	1,900,788	844,832	1,233,132	2,960,456	4,525,513	905,802	2,276	58,123,257
1928	100,680	14,435,347	3,992,639	418,863	1,008,300	226,486	380,286	403,926	6,743,571	5,077,290	8,263,060	5,871,235	1,950,207	728,841	1,181,125,8,006,321	4,496,310	944,735	4,923	57,139,146	
1929	99,300	14,286,313	3,840,098	419,371	1,006,000	293,449	467,343	387,241	6,661,827	4,977,230	7,291,917	5,868,859	2,070,775	725,611	1,194,842	3,075,566	4,550,165	968,944	1,239	55,987,770
1930	94,921	13,998,226	3,631,280	394,506	1,287,000	224,722	470,946	395,848	6,327,847	4,186,563	6,632,728	3,657,624	1,928,389	667,107	1,178,675	3,121,672	4,632,970	933,198	5,033	52,277,188
1931	92,449	13,432,777	3,145,731	379,239	1,126,000	210,367	461,498	394,007	6,831,341	4,517,054	4,717,761	3,826,274	2,899,570	683,774	1,114,266	3,128,312	4,625,853	1,026,906	652	61,014,762
1932	89,667	12,638,077	2,930,931	361,229	1,025,000	207,442	453,149	346,552	6,262,481	4,190,765	5,429,049	3,318,866	2,374,156	662,029	1,066,182	3,125,419	4,741,864	1,060,583	2,455	60,164,453
1933	90,300(b)	12,633,000	3,165,700	366,200	1,089,000	198,500	474,500	365,000	6,176,400	4,579,300	7,036,700	4,024,100	2,184,300	640,000	1,060,200	3,178,200	4,839,100	1,073,200	—	53,670,000
(estimate)	92,335(b)	12,633,000	3,165,700	366,200	1,088,000	198,500	474,500	365,000	6,176,400	4,579,300	7,036,700	4,024,100	2,184,300	640,000	1,060,200	3,178,200	4,839,100	1,073,200	—	66,550,000

Note.—The figures for Expenditure represent the Net Expenditure after taking into account receipts noted in the Navy Appropriation Accounts as receipts in excess of estimated Appropriations in Aid.

(a) Exclusive of Royal Marine Police.

(b) Maximum for the year.

**EXPENDITURE FOR NAVAL PURPOSES OF THE  
PRINCIPAL FOREIGN POWERS.**

**UNITED STATES NAVY.**

**APPROPRIATION BILL, 1934 (July 1, 1934, to June 30, 1935).**

Appropriation Title.	Appropriations.	
	1934-35. Dollars.	1933-33. Dollars.
Salaries, office of the Secretary of the Navy . . . . .	154,800	215,520
Salaries, General Board . . . . .	11,304	12,560
Salaries, Naval Examining Board . . . . .	9,540	10,800
Salaries, Compensation Board . . . . .	6,156	8,700
Contingent Expenses Navy Department . . . . .	75,000	80,000
Printing and Binding . . . . .	375,000	550,000
Pay, Miscellaneous . . . . .	862,280	1,450,000
Contingent, Navy . . . . .	15,000	15,000
State, Marine Schools . . . . .	189,407	217,800
Care of lepers, Guam . . . . .	35,000	35,000
Operation and conservation of Naval Fuel Reserve . . . . .	59,603	—
Naval Research Laboratory . . . . .	183,116	213,000
Salaries, Office of Naval Records and Library . . . . .	30,672	39,240
Salaries, office of Judge Advocate General . . . . .	104,940	130,240
Salaries, office of Chief of Naval Operations . . . . .	61,830	73,760
Salaries, Board of Inspection and Survey . . . . .	15,516	20,780
Salaries, Naval Communications . . . . .	108,720	134,980
Salaries, office of Naval Intelligence . . . . .	32,760	41,440
Recreation for enlisted men . . . . .	465,582	368,000
Contingent, navigation . . . . .	5,000	9,000
Gunnery and engineering exercises trophies . . . . .	35,229	42,750
Instruments and supplies . . . . .	497,390	533,243
Ocean and lake surveys . . . . .	52,910	65,000
Naval training station, California . . . . .	155,150	160,200
Naval training station, Rhode Island . . . . .	65,000	202,000
Naval training station, Great Lakes . . . . .	6,200	245,000
Naval training station, Hampton Roads . . . . .	—	225,000
Naval training station, Norfolk . . . . .	215,950	—
Naval Reserve . . . . .	2,745,509	3,077,686
Naval Reserve Officers' Training Corps . . . . .	74,314	90,085
Naval War College . . . . .	103,257	110,000
Salaries, Bureau of Navigation . . . . .	407,943	500,540
Salaries, Hydrographic Office . . . . .	337,356	430,980
Contingent and miscellaneous expenses, Hydrographic Office . . . . .	115,194	138,120
Salaries, Naval Observatory . . . . .	149,994	193,540
Contingent, etc., expenses, Naval Observatory . . . . .	20,000	25,000
Astrographic and astronomical plant . . . . .	—	114,000
Engineering . . . . .	15,542,000	18,030,000
Engineering Experimental Station, Annapolis . . . . .	268,470	333,040
Salaries, Bureau of Engineering . . . . .	13,662,200	15,821,000
Construction and repair of vessels . . . . .	312,670	393,900
Salaries, Bureau of Construction and Repair . . . . .	10,545,600	11,271,000
Ordnance and ordnance stores . . . . .	134,703	165,000
Torpedoes and appliances . . . . .		
Purchase and manufacture of smokeless powder . . . . .		1,000,000
Salaries, Bureau of Ordnance . . . . .		

UNITED STATES NAVY—*continued.*

Appropriation Title.		Appropriations.	
	1934-35. Dollars.	1932-33. Dollars.	
Pay, Subsistence and transportation . . . . .	137,439,992	149,877,831	
Maintenance, supplies and accounts . . . . .	7,559,000	9,417,500	
Fuel and transportation . . . . .	6,633,658	6,735,000	
Salaries, Bureau of Supplies and Accounts . . . . .	683,670	873,000	
Medical Department . . . . .	1,894,666	1,840,000	
Care of the dead . . . . .	68,000	68,000	
Salaries, Bureau of Medicine and Surgery . . . . .	69,048	87,560	
Maintenance, Yards and Docks . . . . .	6,459,250	8,400,000	
Contingent, Yards and Docks . . . . .	117,635	138,000	
Salaries, Bureau of Yards and Docks . . . . .	251,450	314,020	
Public Works . . . . .	*2,000,000	2,490,000	
Aviation, Navy . . . . .	18,643,320	25,245,430	
Salaries, Bureau of Aeronautics . . . . .	237,078	290,400	
Pay, Naval Academy . . . . .	697,770	861,517	
Current and miscellaneous expenses, Naval Academy . . . . .	77,300	79,700	
Maintenance and repairs, Naval Academy . . . . .	774,716	940,000	
Pay, Marine Corps . . . . .	14,390,612	15,151,089	
Pay, civil employees, Marine Corps . . . . .	241,510	305,030	
General expenses, Marine Corps . . . . .	6,016,325	6,458,720	
Increase of the Navy—Construction and Machinery . . . . .	†32,342,000	15,063,000	
Increase of the Navy—Armour, Armament, and Ammunition . . . . .	6,277,334	3,000,000	
Modernisation of vessels . . . . .	†470,000	14,000,000	
Total Annual appropriation . . . . .	291,632,399	317,583,591	
Total Permanent and Indefinite . . . . .		1,322,550	
Total . . . . .		318,906,141	

\* This includes \$1,450,000 of the appropriation Public Works Navy Emergency Construction Act, July 21, 1932, and \$550,000 of the unexpected balances of the amounts heretofore appropriated under the heading Public Works Bureau of Yards and Docks.

† This appropriation is for the building of vessels already authorised and for the commencement of one cruiser of sub-category (a) and three cruisers of sub-category (b), authorised by an Act approved February 13, 1929, and includes \$5,000,000 which the Secretary of the Treasury is authorised and directed upon request of the Secretary of the Navy to transfer from the Naval Supply Account Fund.

‡ Towards the modernisation of New Mexico, Mississippi, and Idaho authorised by an Act, February 28, 1931, to remain available until expended.

A sum of 238 million dollars of the total of 3,300 million dollars authorised by the National Industrial Recovery Act (1933) for the expenditure on public works has been allocated for naval construction. This sum provides for the construction of 32 vessels for which contracts have now been placed; 46 million dollars is to be expended during the fiscal year 1933-34, 105 million dollars during the fiscal year 1934-35, and the remainder during the fiscal year 1935-36.

## FRENCH NAVY.

## ESTIMATES, 1934-35.

The figures for 1934-35, including the vote for new construction, as compared with 1933-34 are as follows :—

		1934-35. Francs.	1933-34. France.
Ordinary . . . . .		1,445,795,448	1,373,183,916
Extraordinary . . . . .		1,228,998,549	1,339,071,057
Air Service . . . . .		268,489,497	—
<b>Total . . . . .</b>		<b>2,943,283,494</b>	<b>2,712,254,973</b>

## ROYAL ITALIAN NAVY.

## ESTIMATES, 1934-35.

## ORDINARY EXPENDITURE.

		1934-35. Lire.	1933-34. Lire.
General Expenses . . . . .		5,278,000	5,299,800
Pensions . . . . .		98,070,000	98,070,000
Lighthouses and Pilotage . . . . .		6,302,000	6,302,000
Maintenance, Construction, Armaments, Establishments, and Coast Works . . . . .		1,028,140,000	1,016,930,000
<b>Total . . . . .</b>		<b>1,135,790,000</b>	<b>1,128,601,800</b>

## EXTRAORDINARY EXPENDITURE.

General expenses of the Navy and Various . . . . .		48,990,477	232,620,477
Transfer of Funds . . . . .		40,000,000	38,000,000
<b>Grand Total . . . . .</b>		<b>1,224,780,477</b>	<b>1,397,222,277</b>

## GERMAN NAVY.

## ESTIMATES, 1934-35.

		1934-35. Reich Marks.	1933-34. Reich Marks.
Gross . . . . .		236,243,200	186,243,200
Appropriations in aid . . . . .		3,238,050	3,238,050
<b>Net . . . . .</b>		<b>233,005,150</b>	<b>183,005,150</b>

## BRITISH AND FOREIGN NAVIES.

## PRINCIPAL OFFICIALS.

## GREAT BRITAIN.

*First Lord.*—The Right Hon Sir Bolton M. Eyres Monsell, G.B.E., M.P.*First Sea Lord and Chief of Naval Staff.*—Admiral Sir Ernle M. Chatfield, K.C.B., K.C.M.G., C.V.O.*Second Sea Lord and Chief of Naval Personnel.*—Vice-Admiral Sir A. Dudley P. B. Pound, K.C.B.*Third Sea Lord and Controller.*—Vice-Admiral R. G. H. Henderson, C.B.*Fourth Sea Lord and Chief of Supplies and Transport.*—Rear-Admiral G. Blake, C.B., D.S.O.*Deputy Chief of Naval Staff.*—Vice-Admiral C. J. C. Little, C.B.*Civil Lord.*—Captain David Euan Wallace, M.C., M.P.*Parliamentary and Financial Secretary.*—Lord Stanley, M.C., M.P.*Permanent Secretary.*—Sir Oswyn A. B. Murray, G.C.B.

## FOREIGN POWERS.

Country.	Minister of Marine.	Chief of Staff.
Argentina . . .	Captain Eleazar Videla	Captain Léon Scasso
Brazil . . .	Vice-Admiral Protagenes Pereira Guimarães	Rear-Admiral Henrique Aristides Guilhem
Chile . . .	Don Emilio Bello Codecido (Minister of National Defence)	—
	Rear-Admiral Reyes del Rio (Director-General of the Navy)	Rear-Admiral Luis A. Muñoz Artigas
China . . .	Admiral Chen Shao-Kwan (Minister of Naval Affairs)	Rear-Admiral Chen Hsiun Yung (Vice-Minister)
Cuba . . .	Th. Stauning —	Captain G. del Real
Denmark . . .	Vice-Admiral H. Rechnitzer (Chief of Naval Defence and Director of the Naval Ministry)	Rear-Admiral A. G. Topsoe Jensen
Ecuador . . .	Senor Octavio G. Ycaza	Captain de Navio Anda (Director of the Fleet)
Estonia . . .	M. A. Kerem (Minister of Defence)	General N. Reek
Finland . . .	A. Oksala (Minister of Defence)	Major-General Oesch
	Lieut.-General V. Öesterman (Chief of Army and Navy)	—
France . . .	M. François Pietri	Vice-Admiral G. E. J. Durand-Viel
Germany . . .	General von Blomberg (Minister of Defence)	Vice-Admiral Foerster (C.-in-C. of Fleet)
	Admiral Dr. Raeder (Chief of Navy Department (Admiralty))	—
Greece . . .	Rear-Admiral (retd.) A. Hadjikyriakos	Captain E. Cavadias
Italy . . .	Signor Mussolini (Under-Secretary, Rear-Admiral Cavagrarli)	Vice-Admiral Gino Ducci
Japan . . .	Admiral M. Osumi, C.B.	H.I.H. Prince Hiroyasu Fushimi
Latvia . . .	General Balodis (Minister of Defence)	Captain Spade (Chief of Naval Forces)
Lithuania . . .	General Sniukstas (Minister of War)	—
Mexico . . .	General Plutarco Calles (Minister of War and Marine)	Rear-Admiral P. O. Blanco
Netherlands . . .	Dr. L. N. Deckers (Minister of Defence)	Rear-Admiral J. de Graaf
Norway . . .	J. I. Kobro (Minister of Defence)	Rear-Admiral von der Lippe C.-in-C. and C.N.S.
Paraguay . . .	Dr. Casal Ribeiro	Lt.-Cdr. A. T. Aponte (Director of the Navy)
Peru . . .	Captain Carlos Rotalde (Minister of Marine and Aviation)	Captain Juan Althaus
Poland . . .	Marshal Pilsudski	Rear-Admiral J. Swirski (Chief of Navy Department)
Portugal . . .	Captain Anibal Mesquita Guimaraes	Vice-Admiral José Dionizio de Souza e Faro
Roumania . . .	Rear-Admiral I. Balanescar (Inspector-General and C.-in-C.)	Commander E. Rosca
Siam . . .	Phya Bahol (Minister of Defence)	—
Soviet Union . . .	N. E. Voroshilov (President of Committee of Defence)	V. M. Orlov
Spain . . .	Señor Pita Romero	Vice-Admiral Xavier de Salas y Gonzalez
Sweden . . .	Ivar Vennerström (Minister of Defence)	Vice-Admiral Lybeck
Turkey . . .	Captain Houliossi (Under-Secretary for the Navy)	—
United States . . .	C. Swanson (Secretary of the Navy)	Admiral W. H. Standley (Chief of Naval Operations)
Uruguay . . .	General Domingo Mendivil (Minister of War and Marine)	Rear-Admiral Arturo Juambelz (Director of Navy)
	Dr. Augusto Sado (Under-Secretary)	Captain S. Banekovic
Yugoslavia . . .	General Stoyanovic (Minister of War and Marine)	—
	Rear-Admiral M. L. Polic (Head of Navy)	—

## BRITISH AND FOREIGN NAVAL ATTACHÉS.

## BRITISH NAVAL ATTACHÉS ACCREDITED TO FOREIGN COUNTRIES.

To :—

- Albania, Bulgaria, Greece, Italy, Yugoslavia, Roumania, and Turkey : Naval Attaché, Captain H. Pott, M.V.O.R.N. (appointed 26th April, 1934) ; Assistant Naval Attaché, Commander (E.) F. V. Stopford (appointed 7th March, 1933) ; Headquarters, Rome, Italy.
- Belgium, France, Netherland, Portugal and Spain : Naval Attaché, Captain J. U. P. Fitzgerald, R.N. (appointed 8th October, 1931) ; Assistant Naval Attaché, Commander (E.) ; F. V. Stopford (appointed 7th March, 1933) ; Headquarters, Paris, France.
- Denmark, Esthonia, Finland, Germany, Latvia, Lithuania, Norway, Poland and Sweden : Naval Attaché, Captain G. C. Muirhead-Gould, D.S.C., R.N. (appointed 21st July, 1933) ; Assistant Naval Attaché, Commander (E.) F. V. Stopford (and Assistant to Naval Attachés, Paris and Rome), (appointed 7th March, 1933) ; Headquarters, Berlin, Germany.
- Japan and China : Naval Attaché, Captain J. G. P. Vivian, R.N. (appointed 6th January, 1933) ; Assistant Naval Attaché, Commander (E.) G. C. Ross, R.N. (appointed 15th April, 1933) ; Headquarters, Tokyo, Japan.
- U.S.A., Cuba, Mexico, and Panama : Naval Attaché, Captain A. R. Dewar, R.N. (appointed 6th May, 1933) ; Assistant Naval Attaché, Engineer-Commander A. L. P. Mark-Wardlaw (appointed 28th July, 1934) ; Headquarters, Washington, U.S.A.
- South America, including the Argentine Republic, Brazil, Chile, Ecuador, Peru, and Uruguay : Naval Attaché, Captain R. H. C. Halifax, R.N. (appointed 1st July, 1933).

## FOREIGN NAVAL ATTACHÉS ACCREDITED TO GREAT BRITAIN.

From :—

- Argentine : Post Vacant.
- Belgium : General Major Albert Nyssens (Military Attaché, Belgian Embassy), 103, Eaton Square, S.W.1.
- Brazil : Engineer Captain Natal Arnaud, Brazilian Embassy, 19, Upper Brook Street, Mayfair, W.I.
- Chili : Post Vacant.
- China : Commander Cheng Yueh-Shu, Chinese Legation, 49 Portland Place, W.1.
- Denmark : Post Vacant.
- Finland : Commander Vainö Lauri Kopio, 37, Smith Square, Westminster, S.W.1.
- France : Capitaine de Vaisseau Latham ; Assistant N.A., Lieutenant de Vaisseau F. M. G. Lafarque, French Embassy, Albert Gate House, S.W.1.
- Germany : Captain Erwin Wassner, German Embassy, 9, Carlton House Terrace, S.W.1.
- Greece : Post Vacant.
- Italy : Commander Count Ferrante Capponi ; Assistant N.A., Lieutenant (E.) Gino Iori, 4, Three King's Yard, Davies Street, W.1.
- Japan : Captain Arata Oka, I.J.N. ; Assistant N.A., Commander R. Yanagimoto, I.J.N. and Lieutenant Kazunao Iriye, I.J.N., Broadway Court, Westminster, S.W.1.
- Norway : Post vacant.
- Peru : Post vacant.
- Poland : Post vacant.
- Portugal : Post vacant.
- Roumania : Captain Gheorghe Niculescu, Naval and Military Attaché ; Assistant, N.A., Captain Cezar Marinescu, 4, Cromwell Place, S.W.7.
- Spain : Contra Almirante Alvaro Guitian, 24 Belgrave Square, S.W.1.
- Sweden : Commander E. D. Torén, Swedish Legation, 27, Portland Place, W.1.
- United States of America : Naval Attaché, Captain W. S. Anderson, U.S.N. ; Assistant N.A., Captain H. S. Howard, U.S.N. (Construction Corps) ; Commander B. H. Wyatt, U.S.N. ; Lieutenant-Commander L. C. Stevens, U.S.N. ; (Construction Corps), 4, Grosvenor Gardens, S.W.1.
- Uruguay : Post vacant.

DIMENSIONS AND PARTICULARS  
OF  
BRITISH AND FOREIGN WARSHIPS.



## LIST OF BRITISH AND FOREIGN SHIPS.

Warships are arranged in classes, except in some instances where they are arranged alphabetically. The following abbreviations are used throughout the List:—

a.c.	Armoured cruiser.	A.T.	Aircraft tender.
a.g.b.	Armoured gunboat.	S.C.	Seaplane carrier.
g.b.	Gunboat.	H.N.S.	Harvey nickel steel.
b.	Battleship.	H.S.	Harveyised or similar hard-faced steel.
b.c.	Battle-cruiser.	K.S.	Krupp steel.
l.cr.	Light cruiser.	t.	Speed and H.P. at trials (in speed and H.P. columns).
c.d.s.	Coast-defence ship.	b.p. or p.p.	Length of ship between perpendiculars.
M.Cr.	Minelaying cruiser.	L.	Light guns under 15 cwt., including boats' guns.
cr.	Cruiser.	M.	Machine guns.
A.A. or H.A.	Anti-aircraft guns.	Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.	
A.C.	Aircraft carrier.		

Torpedo Tubes: (D.) = double; (T.) = triple; (Q.) = quadruple; (sub.) = submerged; a.w. = above water.

The following abbreviations are used to distinguish the various types of boilers:—

W.T.	Water-tube boilers, where the type is not known.	My.	Myabara.
B.	Belleville.	Nic.	Niclausse.
Bl.	Blechynden.	Pen.	Penhoet.
B. & W.	Babcock and Wilcox.	T.	Thornycroft.
D'A.	D'Allest.	T.S.	Thornycroft-Schulz.
		Y.	Yarrow.

The following abbreviations distinguish types of machinery:—

P.T.	Parsons turbines.	tur.	Turbines, where the type is not known.
C.T.	Curtis turbines.	recip.	Reciprocating engines.
B.C.T.	Brown-Curtis turbines.	I.C.	Internal combustion engines.
(G.)	Geared turbines.		

In later pages (marked P1, P2, etc., towards the end of the volume) plans of most of the ships appear.

Unless otherwise stated, the displacements are Standard displacements (*i.e.* excluding fuel and reserve feed water).

## GREAT BRITAIN.—Battleships and Battle Cruisers.

NAME.	DATE FOR SCRAPPING CLASS, AND REPLACEMENT UNDER WASHINGTON TREATY. <sup>§</sup>	Horse- Power. Type of Boilers.	Where Built.	Makers of Engines. Type of Machinery.	Cost.	Completion, Date of Launching.	Armour.				Armament.				Fuel, Coal Oil.	Speed, Knots.	Tubules, Torpids.	Complement (War).
							Belt.	Deck.	Side above Belt.	Bulkkhead.	Gun Position.	Guns.	Guns.	Guns.				
b. Barham.	1935 <sup>§</sup>	31,100 613 <sup>4</sup> 104 0	31 3	75,000 Y.	Clyde&lk J. Brown B.C.T. (G.)	1914 1915 2,470,113	ln. 13-4	in. 3-1	in. 6	in. 4-2	in. 11	6	8 15-in., 12 6-in., 4 4-in. A.A., 4 3-pr.; 5 M.; 11 L. 1 catapult, 1 aircraft	21"	25	3425	112 <sup>t</sup>	
b.c. Hood.	1941 1930 <sup>§</sup>	42,100 860 <sup>4</sup> 105 3	28 6	144,000	Clyde&lk J. Brown B.C.T. (G.)	1918 1920 5,698,946*	12-6	3-1	7-5	5-4	11	(a)	8 15-in., 12 5-5-in., 4 4-in. A.A., 4 3-pr., 2 2-pr.; a.w. 5 M.; 11 L.	21"	31	4600	1341	
Malaya <sup>¶</sup> .	1930 <sup>§</sup>	31,100 640 <sup>4</sup> 104 0	31 3	75,000 B.&W.	Walker . WallSEND . P.T.	1915 1916 2,945,709	13-6	3-1	6	4-2	11	6	8 15-in., 12 6-in., 4 4-in. A.A., 4 3-pr., 1 2 pr.; (sub.) 5 M.; 11 L.	21"	25	3425	1136	
Nelson .	1942	33,500 710 106 0	30 0	45,000	N'w'c'stle- on-Tyne B.C.T. (G.)	1925 1927 6,410,071*	14	6 <sup>4</sup>	..	..	16-9	..	9 16-in., 12 6-in., 6 4-7-in. A.A.; 4 3-pr., 1 2-pr. mult. p.p., 2 2-pr.; 5 M.; 24" 11 L.	21"	23	3900	1360	
b. Queen Elizabeth	31,100 644 <sup>4</sup> 104 0	31 3	75,000 B.&W.	Portsm'th WallSEND . P.T.	1913 1915 2,473,103	13-4	3-1	6	4-2	11	6	8 15-in., 12 6-in., 4 3-pr., 4 4-in. A.A.; 5 M.; 11 L.	21"	25	3425	1187		

b.	Ramillies	1941	620 <sup>4</sup> 102 0	Dalmuir	Beardmore, P.T.	1916 1917 3,295,816		1010
b.	Resolution	1937	620 <sup>4</sup> 101 4	Jarrow	Palmer P.T.	1915 1916 2,449,680		1012
b.	Revenge	1937	29 150 1025 <sup>4</sup> 1101 5	Barrow	Vickers P.T.	1915 1916 2,406,368	18-4 4-1 6 6-4 11	1104
b.	Royal Oak	1938	620 <sup>4</sup> 102 1	Devonport	Hawthorn P.T.	1914 1916 2,468,269		1149
b.	Royal Sovereign	1938 <sup>4</sup>	620 <sup>4</sup> 101 6	Portsmouth	Parsons P.T.	1915 1916 2,570,504		1104
b.c.	Renown	1940	102 4	Govan	Fairfield B.C.T.	1916 1916 3,117,204	2 6-3 4-3 11-7	1188
b.c.	Repulse	1939	32,000 794 <sup>4</sup> 102 6	B. & W.	Clydebank J. Brown B.O.T.	1916 1916 2,829,087	9-3 K.O.	—
b.c.	Rodney	1942	33,900 710 106 1 30 0	45,000	Birkenhead Cammell Laird B.C.T.(G.)	1925 1927 6,414,653*	14 6 <sup>1</sup> .. .. 16 ..	31.5    300
b.	Valiant	1939	31,100 6,991 104 1 0 31 3	75,000	Fairfield B.C.T.	1914 1916 2,537,087*	13-6 3-1 6 4-2 11	1209
b.	Warspite	1938 <sup>4</sup>	31,100 6,441 <sup>2</sup> 104 1 0 31 3	75,000	Devonport Hawthorn P.T.	1913 1915 2,518,360*	13-6 3-1 6 4-2 11	—
<i>Digitized by Google</i>								

\* Total estimated cost of ship including guns.  
† Repulse has 8 a.w. tubes in addition.

‡ Keppel at the charge of the Federated Malay States.  
§ The London Naval Treaty (1930) suspended replacement of capital ships during the years 1931-35 inclusive.

(a) Guns are in shields of 1-in. H.T. plating.

(b) Speed without bulges.

|| Speed with bulges.

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## GREAT BRITAIN.—Aircraft Carriers.

Class.	Name.	Horse-Power.	Where Built.	Maker of Engines.	Type of Machinery.	Cost.	Purchased under construction do.	Armour.		Speed.	Fuel, Coal, Oil.	Complement (War).
								Belt.	G.E. Plate.			
A.C.	Argus	14,450	R. Ins. 75 9	Ins. 21 0	20,000 Dalmuir P.T.	1917	1918	2	6 in.	20.2	—	420
S.C.	Ark Royal *	6,900	366	50 10	17 6	3000 Blyth S.B. Co.	1914	1914	..	..	—	2000
A.C.	Courageous	22,500	786	90 6	22 3	30,000 Y. over rubbers	Walker † Parson's P.T.(G.)	1916	1928 As aircraft carriers.	1,785,940 (a) { 2,115,944 (b)}	9-7	—
A.C.	Glorious	22,600	667	105 2	21 11	50,000 Y.	Belfast † Harland & Wolff P.T.(G.)	1916	1930 As cruisers.	2,119,066 (a) { 2,137,374 (b)}	9-7	—
A.C.	Eagle, ex-Almirante Cochrane.	22,450	786	90 1	21 6	90,000 Y.	Walker (Armstrong) B.C.T.	1918	1924	4,211,576	..	—
A.C.	Furious	10,850	600	70 3	18 7	40,000 Y.	Walker (Armstrong) Engg Co. B.C.T.(G.)	1916	1925 As an aircraft carrier.	2,426,603	3	—
A.C.	Hermes	—	—	—	—	—	Elswick Parsons Co. P.T.(G.)	1919	1924	2,080,263†	..	—

\* Used for experimental work.  
(a) First cost of ship as a cruiser.

† Reconstructed as aircraft carriers at Devonport dockyard.  
(b) Estimated cost of reconstruction as an aircraft carrier.

‡ Over rubber; 120 ft. over palliades.  
§ Aircraft carrier is included in the 1934 programme, to be built by contract.

# GREAT BRITAIN.—Cruisers.

Class	Name					Armour.				Armament.				Fuel. Coal. Oil.	Complement (War.)	
		ft.	ins.	ft.	ins.	Cost.	2	In.	Guns.	Deck.	6-in. Pocedde	6-in.	Torpedo Tubes.	knots.		
Southampton Class	Newcastle, ex-Minotaur. Southampton, ex-Holophemus.	9 000	584 on W.L.	61	8	17	0	..	Vickers, Tyne John Brown	Bldg.	..	..	..	..	..	
Aretusa Class	Galatea . Arethusa . Penelope .	5,200	506	51	0	13	10	64,000	(Scott) Greenock (John & Wolf)	1934 est. 1936	..	..	6 6-in. guns, 4 4-in. A.A., 18 smaller.	..	..	
Learner Class	Ajax . Achilles . Neptune . Orion . Leander .	7,030	5544	55	8	16	072,000	P.T. (G.) b.p.	Barrow Vicker- Head Cammell Laird Portsm'th Parsons Devonport Armstrongs Devonp'r't Vicker- Armstrongs	1932 1933 1933 1934 1932 1931 1931	.. 1,560,414 1,548,653 .. 1,667,819 ..	.. .. .. .. .. ..	8 6-in., 4 4-in. A.A., 4 3-pdr. guns, 5 Q.M.G., 12 smaller, 1 floatplane	324	— 1800	
M.C.	Amphion . Apollo . Adventure .	7,000	530 b.p.	56	8	15	872,000	5 40,000 tur. and Diesel	Portsm'th Devonport Vickers	1934 est. 1936 1934 1924	.. .. ..	8 6-in., 4 4-in. smaller.	.. 1,246,083 ..	324 1800 ..	— 1800	
														.. 4 47-in. A.A., 4 3-pdr., 4 2-pdr. Pom Poms; 2 M., 8 L. 810 mines	— 1620	395

\* H.M.S. Phœton of Amphion class has been taken over by Australia and has been renamed H.M.A.S. Sydney.

GREAT BRITAIN.—Cruisers—*continued.*

Class.	Name.	Where Built.	Maker of Engines.	Cost	Gun Position	Armour.		Speed, knots.	Fuel, Coal, Oil.	Complement (War.)
						Belt.	Deck.			
Kent Class	Berwick . Cornwall . Cumberland .	Govan Devonport Barrow (G.) Y.	Fairfield . Beardmore Vickers	£ 2,029,526 1,252,110* 2,960,821*	1926 1926 1926	8-in., 4-4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 8 L., 1 aircraft	2 Q. 21"	31½	— 3200	700
Carlisle Class.	Cairo . Calcutta . Capetown . Carlisle . Colombo .	Birkenhead Barrow . Govan (G.) Y.	Cammell Laird Vickers . Cammell Laird Fairfield . Govan . Fairfield .	£ 40,000 1918 1918 1919 1918 1919 1922 1918 1919	1918 1918 1919 1919 1919 1922 1918 1918 1919	1919 832,123 1,984,720 669,216 692,308	3 — ..	5 6-in., 2 3-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 8 L.	8 a.w. 21" (D.)	29 950
Caledon Class.	Caledon . Calypso . Cardiac .	Birkenhead P.T. (G.) Y.	Cammell Laird Newcastle Hawthorn (Hawthorn) Leslie Greenock Scot's	£ 40,000 450 -450	1916 1917 1917 1916	547,300 529,190 534,583	3 — ..	5 6-in., 2 3-in. A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 8 L.	8 a.w. 21" (D.)	29 935
Cambrian Class	Castor . Constance .	40,000 turb.	Birkenhead Cammell Laird .	£ 358,300 374,270	1915 1915	3 —	4 6-in., 2 3-in. A.A., 4 3-pr., 2 2-pr. Pom Poms; 1 M.; 8 L. [Champion 1 3-in. A.A., and no 3-pr.]	2 21"	29 841	300



**GREAT BRITAIN—Cruisers, &c.—continued.**

Class.	NAME.	Where Built.	Maker of Engines	Date of Launch.	Date of Completion.	Armour.		Armament.		Speed.	Fuel, Coal, Oil.	Complement (War).
						Gun Position.	Belt.	Deck.	Guns.			
Improved Birmingham Class	Effingham	Portsmouth.	Harland & Wolff	1921	1925	2,138,999 £	In.	In.	7 7.5-in., 3 4-in. A.A., { 4 a.w. 2 M., 8 L.	30½	713	
Frobisher †	Frobisher	(G.) Y.	{ 65 2 { 17 3 (65,000) (G.) Y.	1920	1924	2,035,915†	{ 3 —	Shields 6 7.5-in., 2 4-in. A.A., 2 sub. 4.3-pr., 2 M., 8 L.	30½	2170	715	
E Class	Enterprise	Devonport Eng. Co.	John Brown	1919	1926	1,690,658*	{ 3-1½ 1	7 6-in., 3 4-in. A.A., 4.3-pr., 2 2-pr. Pom Poms, 2 M., 8 L., 1 aircraft.	16	33	577	
Emerald	Emerald	Clydebank	Elswick Armstrong	1920	1926	1,617,120	...	Poms, 2 M., 8 L., (Q.)	21*	1750	—	
York Class	Exeter	B.C. (G.) Y.	Devonport Parsons	1929	1931	1,837,415*	...	6 8-in., 4 4-in. A.A., 4.3-pr., 6 M., 8 L., 2 aircraft.	6	32	630	
Improved Birmingham Class	Hawkins	Chatham (G.) Y.	Parsons Co.	1917	1919	1,599,741	3 —	Shields 7 7.5-in., 4 4-in. A.A., 4 a.w. 4.3-pr., 2 2-pr. Pom Poms; 2 M., 8 L.	29½	2680	747	
Kent Class	Kent	80,000 Chatham (G.) Y.	...	1926	1928	2,084,213†	...	...	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms; 4 M., 8 L., 1 aircraft.	31½	685	
London Class	London	Portsmouth P.T.	Fairfield	1927	1929	2,029,949*	...	...	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 8 L., 1 aircraft.	32½	685	
Norfolk Class	Norfolk	Fairfield (G.) Y.	Fairfield	1928	1930	2,141,961*	...	...	8 8-in., 4 4-in. A.A., 4 3-pr., 4 2-pr. Pom Poms, 4 M., 8 L., 1 aircraft.	32½	685	

London Class	Shropshire	9730	633	66	0	17	0	80,000	Dalmuir (G.)	Beardmore	1928	1929	1,941,950†	..	..	..	..	..	..	..	..
Sussex	Sussex	9730	633	66	0	17	0	80,000	Hawthorn (G.)	Hawthorn	1928	1929	1,975,800†	..	..	..	..	..	..	..	..
Kent Class	Suffolk	9800	630	68	5	16	3	80,000	Portsmouth (G.)	Leslie	. .	1926	1928	2,180,240†	..	..	..	..	..	..	..
Improved Birmingham Class.	Vindictive	9996	605	65	2	17	3	60,000	Belfast (G.)	Harland & Wolff	1918	1918	1,671,712	3	..	..	..	..	..	..	..
York Class.	York	8250	575	57	0	17	0	80,000	P.T. (P.T.)	Palmer's	. .	1928	1930	1,774,276	..	..	..	..	..	..	..

\* Total estimated cost of ship, including guns.

Four cruisers—three of 9,000 tons, "Southampton" class and one "Arthurs" class—are authorised for commencement in 1935. Contracts for two "Southhamptons" were placed in November, 1934, with Vickers-Armstrongs, Ltd. (hull to be built at Walker-on-Tyne and machinery at Barrow), and the Scots' Shipbuilding and Engineering Co., Ltd., Greenock. The third "Southampton" class cruiser will be built at Devonport Dockyard and the ship of the "Arthurs" class at Portsmouth. (See page 202.)

**Patrol Boats.**—P.C. 74, 610 tons, 1.4-in.; Dart (1918), 610 tons, 20 knots, 1.4-in., 2 12-pr.; Erehus, 7,200 tons; Terror, 7,200 tons; Marshal Soult, 6,400 tons. **Training Ships and Gunnery Drill Ships (ex-Monitor).**—Erebus, 7,200 tons; Terror, 7,200 tons; Marshal Soult, 6,400 tons. **Fishery Protection Gunboats (ex-trawlers).**—Colne, Doon, Dee, Eden, Foyles, Garry, Kenna, Liffey, 490-550 tons, 11 knots, reciprocating machinery, 1 12-pr. **Destroyer Depot Ships.**—Greenwich (1916), 8,100 tons; Sandhurst (converted 1916), 11,500 tons; Woolwich (1932 programme), 10,600 tons, building at Fairfields. **Submarine Depot Ships.**—Lucia, 5,250 tons; Titania, 5,800 tons; Cyclops, 11,300 tons; Medway (Vickers, 1929) displacement 14,630 tons, speed 15 knots, armament 2 4-in., 4 4-in. A.A. One more (Maidstone) was authorised for commencement under the 1928-29 Estimates, but construction cancelled in 1929. **Repair Ships.**—Assistance (1903), 9,600 tons; Resolute (Vickers, 1930), displacement 12,800 tons, speed 15 knots, armament 4 4-in. A.A. **Mine-layers (ex-Monitor).**—Medea, 540 tons, 12 knots, 44 mines; Medusa, Melpomene, Minerva, 355 tons, 10 knots, 52 mines; (ex-trawlers) Vernon, 420 tons; Kate Lewis, 308 tons, 24 mines.

**Surveying Vessels.**—Beaufort, Fitzroy, Flinders, and Kellett, 800 tons, 16 knots, 1 3-pr.; Herald, Ormonde, and Iroquois, 1,650 tons, 15½ knots, 1 3-pr.; Endeavour, 1,280 tons, 13 knots, 1 3-pr.; Challenger (Chatham, 1931)—originally intended as a fishery investigation vessel, 11,40 tons, 1,200 H.P. (recip.), 12½ knots, 1 vessel in 1934 programme. **Nettlayer and Target Towing Vessel.**—Guardian (Chatham, 1931-3), 2,860 tons, 6,500 H.P., 18 knots, 2 4-in. A.A. 1 netlayer in 1934 programme. **Mining School (Vernon) Tender.**—Nightingale (Portsmouth, 1931), Skylark (Portsmouth, 1932), displacement 275 tons, horse-power 400, speed 10 knots, coal capacity 15 tons.

**Boom Defence Vessels.**—Moorgate (Bow, McLauchlan, 1931), 345 tons, 1 4-in. gun; Bishopsgate (Henry Robb, 1932) and Aldgate (1934); Watergate (1934), 290 tons. 3 boom vessels included in 1934 programme. **Tenders.**—For Submarine depot, Portland. Elfin (1933), 222 tons, 230 H.P., 9½ knots. **Gunnery Training Ship.**—Battleship Iron Duke has been de-militarised under the London Treaty and converted to a Gunnery Training Ship (1931-32). **Fleet Target Ship.**—Centurion (ex-battleship), 25,500 tons. **Auxiliaries.**—Tugs, Trawlers, Drifters, Hospital Ship (Maine, 10,100 tons), Oilers, Store ships, etc.

For sloops, minesweepers and river gunboats, see Flotilla tables, pp. 266-7.

# Defence Forces of the Dominions.

## ROYAL AUSTRALIAN NAVY.

*Under Control of the Australian Naval Board.*

Class.	NAME.	Where Built.	Maker of Engines.	Armament				Speed. knots.	Cost. ton.	Complement (W.M.).
				Cost.	G.H. Pounder.	Belt.	Torpedo Tubes.			
Kent Class Cruisers	Australia .	Brown	Brown	£	In.	In.	..	8 3-in., 4 4-in. A.A. 4 3-pr., 4 2-pr. Pom Pom, 4 M., 12 L.	8 21" s.w. (Q.)	31½
Canberra .	Clyde- bank (G.)	B.C. (G.)	80,000	1927	1928	..	..	8 3-in., 4 4-in. A.A. 4 3-pr., 4 2-pr. Pom Pom, 4 M., 12 L.	8 21" s.w. (Q.)	3200
Amphion Class	Sydney { ex-Phaeton }	WallSEND	WallSEND	1934	est.	..	..	8 6-in., 4 4-in. A.A. 21" smaller.	8 21"	32½
Adelaide Type	Adelaide .	P.T.	15 10 25,000	Sydney	1918	1922	..	3 —	2 21"	951
Chatham Type	Brisbane .	P.T.	15 9 25,000	Sydney	Vickers T.	1915	1916	8 —	2 21"	538
Cruiser Digitized by Seaphane Carrier	Albatross .	P.T.	15 6 12,000	Cockatoo Island	Sydney	1928	1929	— —	2 21"	450
Flootilla Leader	Anzac .	P.T.	13 0 36,000	Dunbar- ton	Denny	1917	1917	— —	2 21"	1196
" "	Stuart .	B.C.T.	13 3 40,000	Hebburn	Hawthorn Leslie	1918	1918	— —	2 7 M. & L.	260
Destroyers—"V" Class	Vampire, Vendetta, Voyager, Waterhen.									490
"S" Class	Stalwart, Success, Swordsman, Tasmania, Tattoo.									350
Subvessel Vessel: Moreby (late Silvio) (1918), 1650 tons, length 267 ft, 2,500 H.P., 17 knots, one 8-pr. Depot AND FLAT REPAIR SHIP: Penguin (late Platypus) (J. Brown, Clydebank, 1917). Displacement 8,455 tons, 14 knots, 1 4-in.										182
										Oil

Destroyers—"V" Class.—Vampire, Vendetta, Voyager, Waterhen. Completed, 1917-18; Displacement, 1,090 tons; 27,000 H.P.; speed, 34 knots; armament, four 4-in.; 6 smaller guns, 6 torpedo tubes.

"S" Class.—Stalwart, Success, Swordsman, Tasmania, Tattoo. Completed, 1919; Displacement, 805 tons; 27,000 H.P.; speed, 36 knots; armament, three 4-in.; one 2-pdr, 2 double 21" torpedo tubes.

Subvessel Vessel: Moreby (late Silvio) (1918), 1650 tons, length 267 ft, 2,500 H.P., 17 knots, one 8-pr., one 2-pdr, 2 double 21" torpedo tubes.

Depot AND FLAT REPAIR SHIP: Penguin (late Platypus) (J. Brown, Clydebank, 1917). Displacement 8,455 tons, 14 knots, 1 4-in.

\* Torpedo tubes are removed in "S" class.

## NEW ZEALAND NAVY.

*Under the control of New Zealand Naval Board.*

**Light Cruisers—“D” Class.**—Dunedin; completed, 1919 (Elswick). Dionede; completed 1922 (Vickers). Displacement, 4,850 tons; 40,000 H.P.; speed, 29 knots; armament, 6 6-in., 8 4-in., A.A., 4 3-pr., 2 2-pr. Pom Poms, 2 M., 4 triple 21-in. torpedo tubes; max. fuel, 1,060 tons oil; complement, 450.

**TRAINING AND DEPOT SHIP.—Philomel** (2570 tons).

The Sloops Leith and Wellington (see page 265) are allocated to the station.

## ROYAL CANADIAN NAVY.

*Under control of the Canadian Department of National Defence.*

**Destroyers.**—Champlain (ex-Torley) and Vancouver (ex-Treasurer). Completed, 1919 (Thornycroft). Displacement, 905 tons; 29,000 H.P.; speed, 36 knots; armament, 3 4-in., 1 2-pr., 2 double 21-in. torpedo tubes; oil, 305 tons (radius of action, 3,500 at 15 knots). Saguenay and Skeena completed at Thornycroft's in 1931; displacement, 1,830 tons; 32,000 H.P.; speed, 35 knots; armament, 4 4.7-in., 2 2-pr., 2 quad, 21-in. torpedo tubes; oil, 440 tons.

**Depot Ships.**—Naden and Stadacona. **MINESEEPPING TRAWLERS.**—Festubert, Ypres, and Armentieres (1918), 360 tons.

## SOUTH AFRICA.

[The seagoing force of the South African Naval Service was disbanded in 1934.]

## ROYAL INDIAN NAVY.

**MINESEEPPING SLOOP.**—Clive, 2,021 tons; 1,700 H.P.; 14<sup>1</sup>/<sub>2</sub> knots; 2 4-in., 2 2-pr., 4 3-pr. guns; launched Beardmore, 1919. Lawrence, 1,259 tons; 1,900 H.P.; 15 knots; 2 4-in., 2 12-pr., 4 3-pr. guns; launched Beardmore, 1919. Hindustan, Swan Hunter (1930). Displacement, 1,190 tons; 2,000 H.P.; speed 16 knots; 2 4-in. guns. A new vessel, Indus, is building at Hawthorn Leslie's, launched August 24, 1934.

**SOLOPS.**—Cornwallis, 1,350 tons; 16<sup>1</sup>/<sub>2</sub> knots; 2 500 H.P.; 3 4-in., 2 2-pr., 4 3-pr. guns (launched Hamilton, 1917, as the Lychinis).

**SURVEYING SHIPS.**—Investigator (Vickers, 1907), 1,172 tons; 1,650 H.P.; 13 knots; no guns. Palinurus (Cammell Laird, 1907), 444 tons; 475 H.P.; 11<sup>1</sup>/<sub>2</sub> knots; no guns.

**PATROL BOATS.**—Baluchi (ex-P.C. 55), 682 tons; Pathan (ex-P.C. 69), 695 tons; both 3,900 H.P., 20 knots, and 1 4-in. and 2 12-pr. guns. **DEPOT SHIP.**—Dalhousie (1886), 1,960 tons; 4 3-pr. guns.

**TRAWELE** (target towing).—Madras, 588 tons; 480 H.P.

## ARGENTINE REPUBLIC.

Class.	Name.	Where Built.	Type of Machinery.	Horse-Power.	Draughts.	Beam.	Length, feet (extreme).	Displacement.	Armour.				Armament.				Fuel.	Coal.	Oil.	Speed, knots.	Complement.
									Cost.	Belt.	Deck.	Side above Belt.	Decks.	Gun Position.	Guns.	Torpedoes.					
c.	Almirante Brown	Leghorn	2	In.	In.	In.	In.	1,250,000	1929	1931	..	..	..	6 7·5-in., 12 4-in. A.A.	6	32	—	600			
c.	Vinticinco de Mayo	Genoa (G.)	85,000	164	5·15	5·58	5·58	..	..	..	..	..	..	6 Pom Poms, 1 catapult, 2 seaplanes.	21" (T.)	1660	—	1660			
c.d.s.	General Belgrano†	Leghorn	13,000	24	1897	1899	1899	696,700	6·3	1·3	6	6	6	2 10-in., 10 6-in., 6 4·7-in., 4 6-pr.	—	20	oil	515			
c.l.s.	General San Martin†	Leghorn	13,000	24	1896	1898	1898	200	6·3	1·3	6	6	6	4 8-in., 6 4·7-in.	—	20	oil	431			
c.d.s.	Pueyrredon†	Seatri Ponente (N.Y.S.B.Co.)	13,000	24	1898	1901	1901	782,000	6·3	1·3	6	5	6	2 10-in., 8 6-in., 4 6-pr., 1 1-pr. A.A.	—	20	oil	430			
c.d.s.	Moreno	Quincy, Mass.	45,000*	28	1911	2,200,000	12·10	3·2	9·6	9	12·9	6	12·9	12 12-in., 12 6-in., 4 8-pr., 6 M., 4 L.	22·5 (sub) 21"	—	1200	4200			
b.	Rivadavia	(G.)	27,720	973	1914	1914	1914	..	..	..	..	..	..	..	—	940	940				

The old coast-defence ironclads Libertad and Independencia, 2,595 tons, completed at Birkenhead in 1891-93, and converted to oil fuel in 1927, carry two 9·4-in., four 4·7-in., and four 3-pr. guns. The Libertad is used as parent ship for submarines.

River gunboats Paraná and Rosario (Elswick, 1908), 1055 tons, two 6-in. howitzers, six 3-in., 2 L., 15 knots.

The training-ship (cruiser) (Birkenhead, 1896; refitted 1926), Presidente Sarmiento, 2320 tons, 15 knots; four 4·7-in., four 6-pr., two 3-pr. Sloops (surveying vessels), San Juan and San Luis (Hawthorn Leslie's, Newcastle, 1928), 790 tons, 1—3-in., 12 knots. Alferez Mackinlay (1914), 783 tons, 10 knots. Tugs, Metaco, Toba (completed 1928, at Messrs. Hawthorn Leslie's, Newcastle), Azapardo (1919), Ona, Querandi (Thornycroft, 1914), and 12 others. Nine Mine-sweepers (ex-tugman), seven transports and other auxiliaries.

One cruiser, three sloops, two transports and four coastguard vessels are projected.

\* Moreno and Rivadavia were converted to oil burning and fitted with geared turbines in 1928. + Converted to oil burning and armament altered in 1929. † Used as training ships.

# BRAZIL.

Class.	NAME.	Armour.										Armament.			Speed. Knots.	Coal. Oil. tons.	Complement.				
		Cost.	Belt.	Deck.	Side above Belt.	Side heads.	Gun Position.	Second- ary.	Heavy Guns.	Guns.	Torpedoes.										
c.d.s.	Floriano	3162	267 <sup>1</sup> <sub>3</sub> P.P.	48	13 <sup>1</sup> <sub>2</sub>	3400	L.A. Seyne	.1897	1901	..	13 <sup>1</sup> <sub>2</sub> -4 H.S.	1 <sup>1</sup> <sub>2</sub> ..	..	8 H.S.	3 4 6 p.r.; 2 L.	—	15·0	246 —	260		
b.	Minas Geraes*	19,200	541	83	25	25,000	Elswick	.1909	1910	1,821,400	9-6-4 K.S.	2	9-6-4 K.S.	9 K.S.	12-8 K.S.	9 2 3-in. A.A.; 4 M.	—	—	—	—	
b.	São Paulo	.	.	.	.	25	t B.&W. Barrow	.	1908	1910	.	.	.	.	.	.	—	21	2360 350	850	
cr.	*Bahia.	.	.	.	.	3100	401 <sup>1</sup> <sub>2</sub>	39	13 <sup>1</sup> <sub>2</sub>	22,000	Elswick	.	1909	1910	..	..	..	..	4	27	450
cr.	*Rio Grande do Sul	.	.	.	.	.	B.C.T. (G.)	.	.	.	.	.	.	.	.	.	21 <sup>1</sup> <sub>2</sub> (D)	—	—		

\* In hand for re-conditioning and conversion to oil fuel. Being fitted with new oil-burning water-tube boilers by Thornycrofta, est. 1935.

† Reconstructed, including conversion to oil fuel, at Rio de Janeiro, 1926.

RIVER GUNBOATS.—Missões (1904), 200 tons, 11 knots; Oiapock, 195 tons, 14 knots.

GUNBOATS.—Almirante Bastos dos Reis and Almirante Brasil; ordered in 1931.

MINELAYERS.—Maria do Couto, Carneiro da Cunha, Heitor Perdigão and Muniz Freire.

RIVER MONITOR.—Pernambuco, 470 tons, 11 knots, built at Rio de Janeiro.

GUNBOAT SCOUT.—Victoria (ex-Espírito Santo), 470 tons, two 4·7-in., two 3-pr., 11 knots.

SUBMARINE TENDER.—Ceará (Spezia, 1916), 4000 tons, 4100 H.P., 14 knots, four 4-in. guns.

ARMED TRANSPORT.—Belmont (ex-German SS. Valentin), 5227 tons gross, four 4·7-in., six 6-pr.

TRAINING SHIP.—Saldanha Dágama, building at Vickers'. A four-masted schooner, 3225 tons, 262 feet in length, four 4-in. and one 3-in. A.A. guns.

The approved building programme includes two cruisers of 8,500 tons, to be completed in 8 years. Orders have not yet been placed.

## CHILE.—Armoured Ships.

Class.	NAME	Displacement.	Beam.	Length ft. (Extreme).	Draught ft.	Horse-Power and Boiler-tube.	Type of Machinery.	Where Built.	Date of Launch.	Date of Commission.	Armour.				Armament.				Fuel, Coal, Oil.	Speed, knots.	Complement.		
											Cost.	Belt.	Deck.	Above Belt.	Side.	Deck.	Bulkhead.	Gun Position.	Guns.	Torpedo Tubes.			
b.	Almirante Latorre *	t. 28,950 ft. 661	ft. 92	629	037,000	P.T.	Elswick . 1913	1915	..	..	in. 9-1	in. 4-2½	in. 4½	in. 4½	in. 10	in. 6	10 14-in., 14 6-in., 2 8-in.	4 A.A., 4 3-pr., 1 catapult.	(sub.) 21"	4	23	1000	
a.c.	General O'Higgins	t. 6,977 ft. 412	ft. 62	922	016,000	Y.	Elswick . 1897	1898	..	..	7-5	2	..	..	..	7½-6	6	4 8-in., 10 6-in., 12 3-in.	—	—	21·5	1200	500
b.	Capitan Prat †	t. 5,416 ft. 328	ft. 60	922	012,000	B.	La Seyne 1890	1893	391,000	12	3	4	..	10½	2	4 9·4-in. (Canet), 8 4·7-in. (Canot), 8 6-pr., 11 M.	2	18	775	500	—		

\* Fitted with bulges, converted to oil burning, and modernised in England (completed 1931).      † Submarine parent ship.

## Cruising Ships.

Class.	NAME	Standard Displacement.	Length ft. (Extreme).	Beam.	Draught ft.	Horse-Power.	Where Built.	Date of Launch.	Date of Commission.	Cost.	Guns.	Torpedo Tubes.	Armour.			Armament.			Fuel, Coal.	Speed, knots.	Complement.		
													Standard Displacement.	Length ft. (Extreme).	Beam.	Draught ft.	Cost.	Deck.	Gun Position.				
cr.	Blanco Encalada	t. 3435	ft. 46	ft. 19	6	14,500	Elswick .	1893	1894	..	..	..	1893	1894	..	4-1½	ln.	2 8-in., 8 6-in., 4 3-in.	—	22·78	850	385	
"	Chacabuco	t. 3117	ft. 360	ft. 46	6	17	015,500	Elswick .	1901	1903	..	..	..	1901	1903	..	4½-1½	..	2 6-in., 10 4·7-in., 4 3-in.	—	t	—	—

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OUTERS (Armstrongs, 1930): Maipo, 4,686 tons gross; Rancagua, 8,080 tons displacement, two 4·7-in. guns. COASTGUARD VESSELS: Orompello, Leucoton, Elentura, Colocolo, 550 tons; Aguila, 820 tons; Porvenir, 450 tons. Sibald, Yelcho, Micalvi, Condor, and Yanez. SUBMARINE DEPOT SHIP: Araucano (Vickers-Armstrongs, Barrow), completed 1930; displacement 5,890 tons; armament two 4·7-in.; length b.p. 390 ft.; draught 16 ft. 6 ins.; speed 13 knots; H.P. 2,500. TRAINING SHIP.—General Baquedano (1888), 2350 tons, four 4-in. guns, two 3-pr. Two tugs.

## DENMARK.

Class.	NAME.	Where Built.	Horse-Power.	Armour.						Armament.			Fuel. Coal. Oil.	Complement.
				Cost.	Belt.	Deck.	Side above Belt.	Bulkkhead.	Gun Position.	Guns.	Torpedoes.	Speed. Tubbs.		
a.c. .	Niels Juul	Copenhagen 1918	5500	4	8-4 K.S.	2	..	..	2	10 5 9-in., 2 6-pr., 4 6-pr. (sub.) A.A.	2 18"	170	240 250	309
c.d.s. .	Olfert Fischer	Copenhagen 1908	4600	..	7-4	3	..	..	7	6 2 9 4-in., 4 5 9-in., 6 3-in., 2 6-pr. A.A., 2 1-pr., 2 M. (sub.) A.A.	3 18"	16-0	250	256
c.d.s. .	Peder Skram	Copenhagen 1908	5400	..	8-4 K.S.	2	..	..	7	6 2 9 4-in., 4 5 9-in., 8 3-in., 2 1-pr., 2 3-pr. A.A., 2 M. (sub.) A.A.	4 18"	16-0	250	262

Mine-layers: Lossen, 600 tons, 12 knots, 175 mines; Minekran V and VI, 186 tons, 8 knots, 60 mines; Minekran VII and VIII, 186 tons, 8 knots, 60 mines; Minekran IX and X, 186 tons, 8 knots, 60 mines. Submarine dépôt ship. Submarine dépôt and repair ship Henrik Gerner completed 1928, displacement 490 tons, 2450 H.P., 13 knots, carries two 3-in. guns. Fishery protection vessels: Aegir, Odin, Thor (Iceland Government), Hvítjörn, Diana, Fenris, Island Falk, Fylia (ex-British sloop Asphodel), Beeskitteren, Maagen; Ingolf (1934, to replace Fylia) 3000 H.P., two 4 7 in. and two 6-pr. guns, one seaplane. Surveying vessels Marstrand and Willemoes, 158 tons, 11 knots.

Six minesweepers (ex-Torpedo boats \*), 96 tons. Five patrol vessels (ex-Torpedo boats \*), 96 tons.

\* See Flotilla Tables.

**FRANCE.—Battleships and Armoured Cruisers.**

Class.	NAME. DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY (1922).*	Displacement. (Extreme.) tons ft. ins. ft. ins. 22,189 544 6 88	Beam. Length. (Extreme.) ft. ins. ft. ins. 17,597 480 11 84	Draught. Horse-Power. Type of Machinery and Boilers.	Where Built.	Cost. £	Armour.			Armament.			Fuel, Coal, Oil.	Speed, knots.	Complement.	
							Belt.	Deck.	Side above Belt.	Bulkkhead.	Gun Position.	Guns.	Torpedo Tubes.			
b.	Bretagne 1934	1913 1915 2,589,439	0 29,000 Brest	Nic. P.T.	1909 1911 2,165,200	10-8	2 $\frac{3}{4}$	8 $\frac{3}{4}$	..	12	8 $\frac{3}{4}$	4 12-in., 12 9·4-in., 12 3-in., 2 3-in. A.A., 4 3-pr., 2 1-pr., 2 L.	2 18"	19-25	2100	890
b.	Condorcet	1930	0 22,500 St. Nazaire	Nic. P.T.	1909 1911 2,167,000	11-7	2 $\frac{3}{4}$ -1 $\frac{3}{4}$	7	7	10 $\frac{1}{2}$	7	12 12-in., 22 5·5-in., 2 3-pr., 4 3-in. A.A., 2 1-pr., 2 L.	18"	20-0	2600	1140
b.	Courbet	1930	0 28,000 Lorient	Nic. P.T.	1911 1913 2,508,388	11-7	2 $\frac{3}{4}$ -1 $\frac{3}{4}$	7	7	12	8 $\frac{3}{4}$	4 12-in., 12 9·4-in., 12 3-in., 2 3-in. A.A., 2 3-pr. A.A., 2 1-pr., 2 L.	18"	19-25	2000	890
b.	Diderot	1930	0 22,500 St. Nazaire	Nic. P.T.	1909 1911 2,167,000	10-8	2 $\frac{3}{4}$	8 $\frac{3}{4}$	..	..	..	8 12-in., 16 5·2 in., 40 smaller, catapult, 2 aircraft.	..	abt.	..	..
b.	Dunkerque	1930	100,000 Brest -120,000	Bldg.	5,200,000	+	..	..	..	..	..	8 12-in., 16 5·2 in., 40 smaller, catapult, 2 aircraft.	29	..	..	..
a.c.	Ernest Renan	1930	637,600 St. Nazaire	Nic. Recip.	1906 1909 1,410,000	6 $\frac{3}{4}$ -4	2	5-3	4 $\frac{3}{4}$	6	5	4 7·6-in., 12 6·5-in., 2 3-in., A.A., 4 3-in., 8 9-pr. A.A., 2 1-pr.	18"	24-4	1870	874
b.	Jean Bart 1930	0 28,000 Brest	B. P.T.	1911 1913 2,528,888	11-7	2 $\frac{3}{4}$ -1 $\frac{3}{4}$	7	7	10 $\frac{1}{2}$	7	12 12-in., 22 5·5-in., 4 3-pr., 4 3-in. A.A., 2 1-pr., 2 L.	18"	20-0	2360	1140	
a.c.	Jules Michelet	1930	30,000 Lorient	Guyot Recip.	1905 1908 1,204,107	6-4	2	5-3	6	8	5	4 7·6-in., 12 6·5-in., 2 3-in., A.A., 10 3-pr., 2 M.	18"	22-8	1870	724

b.	Lorraine 1936	. 22,189 544	6 88	6 29	0 29,000	St. Nazaire	1913	1916	2,642,499	B.		7	10 ½	7	10 ½-in., 18 5·5-in., 7 3-in. A.A., 5 3-pr., 2 1-pr., 2 L.	4	20·0	2700 300	1167	
b.	Paris 1934	. 22,189 544	6 88	6 29	0 28,000	La Seyne	. 1912	1914	2,608,920	N. P.T.		7	7	10 ½	7	12 12-in., 22 5·5-in., 4 3-pr., 7 3-in. A.A., 2 1-pr., 2 L.	4	20·0	2450 250	1140
b.	Provence 1935	. 22,189 544	6 88	6 29	0 29,000	Lorient	. 1913	1915	2,589,000	B. P.T.		7	7	10 ½	7	10 ½-in., 18 5·5-in., 4 3-in. A.A., 4 3-pr., 2 1-pr., 2 L.	4	20·0	2700 300	1167
b.	Voltaire	. 17,597 480	11 84	7 27	0 22,500	La Seyne	. 1909	1911	2,163,200	B. P.T.		..	12	8 ½	8 ½	4 12-in., 12 9 4-in., 12 3-in., 2 3-in. A.A., 2 3-pr., 2 L.	2	19·25	2000 —	890
a.c.	Waldeck- Rousseau	. 12,617 521	4 70	7 27	6 35,286	Lorient	. 1908	1910	1,301,880	Nic. t. recip.		5	4 ½	6	5 ½	14 7·6-in., 10 3-in., 10 9-pr. A.A., 2 3-pr., 2 M.	2	23·0	1800 —	874

\* The London Naval Treaty (1930), suspended the replacement of capital ships during the years 1931–36 inclusive. † Reported to be not less than 9 inches.  
 § 1934 programme includes a repeat Dunkerque to be named "Strasbourg," to be laid down at St. Nazaire.

All the above battleships were reconstructed and modernised between 1923 and 1930.  
 Since 1930 all except Diderot, Condorcet and Voltaire have been taken in hand for conversion to oil-fuel burning.

## Aircraft Carriers.

Class.	NAME.	Standard Tons (Extreme)	Length, ft. ins.	Draught, ft. ins.	Horse-power.	Where Built.	Cost.	Date of Launch.	Date of Completion.	Armament.		Speed, kts. L.D. spec.	Fuel.	Cwt. Oil.	Complement		
										Guns.	G.E. Position.						
A.C.	Bearn	. .	22,146 597	1 89 0	37,000	Chantiers de la Mediterranee, La Seyne	1920	1928	£ ..	In. 3 ½	In.	8 6·1-in., 6 3-in. A.A., 8 1-pr. A.A., 12 M. A.A., 41 planes	21·7	21·5	875		
Aircraft Trans- port.	Commandant Teste	10,000	548	0	88 7 23	6 21,000	Chantiers de la Gironde, Bordeaux	1929	1932	..	2 1 ½	..	12 3·9-in. A.A., 8 3-pr. A.A., 12 M., 19 planes, 4 cata- pults, 5 cranes.	—	20·5	oil	648

\* Originally designed and laid down as a battleship; to be reconditioned.

† Schneider-Zeelly turbines (G.). Yarrow-L'Orne S.T. boilers.

## FRANCE.—Cruisers.

(See pages 246-7 for the armoured cruisers Ernest Renan, Jules Michelet and Waldeck-Rousseau.)

Class.	Name.	Standard Displacement.	(Extreme, Length).	Beam.	Draught.	Horse-Power.	Type of Machinery and Boiler.	Where Built.	Date of Launching.	Oars.	Belt.	G.H. Protection.	Armour.	Armament.		Speed.	Fuel, Coal, Oil.	tons.	Knots.	Complement.
														Guns.	Torpedo Tubes.					
<i>Training cruiser</i>	<i>Jeanne d'Arc</i>	6490	557	8	18	8	32,000	Penhoet Yard, St. Nazaire	1980	1931	2	..	..	8 6-in., 4 8-in. A.A., 2 1.6-in., 2 M., 2 seaplanes	21·7*	26	..	506	..	
1931-32 pr.	<i>Jean-de-Vienne</i>	7600	590	0	57	5	16	5	84,000	Lorient.	1933	Bldg.	..	..	9 6-in., 8 3·5-in. A.A., 1-pr.	31	..	..	..	
<i>La Galissonnière</i>		7600	590	0	57	5	16	5	84,000	Brest (Ch. de la Loire) St. Nazaire	..	Bldg.	..	..	9 6-in., 8 3·5-in. A.A., 1-pr.	21·7	32·4	..	..	
<i>Marseillaise</i>		7600	590	0	57	5	16	5	84,000	Bordeaux	1933	Bldg.	..	..	9 6-in., 8 3·5-in. A.A., 1-pr.	21·7	32·4	..	..	
<i>Gloire</i>		7600	590	0	57	5	16	5	84,000	La Seyne	..	Bldg.	..	..	9 6-in., 8 3·5-in. A.A., 1-pr.	21·7	32·4	..	..	
<i>Montcalm</i>		7600	590	0	57	5	16	5	84,000	Penhoet Yard, St. Nazaire	..	Bldg.	..	..	9 6-in., 8 3·5-in. A.A., 1-pr.	21·7	32·4	..	..	
<i>Georges Leygues</i>		10,000	610	3	64	8	20	0	84,000	Brest	1932	1934	1,920,000	4	..	8 8-in., 12 3·5-in. A.A., 8 1-pr., 16 M., 2 catapults, 2 seaplanes	21·7	31	oil	746
<i>Algérie</i>		10,000	610	3	64	8	20	0	84,000	(G.) Pen.	1930	1932	1,570,000	..	..	8 8-in., 12 3·5-in. A.A., 8 1-pr., 16 M., 2 catapults, 2 seaplanes	21·7	31	oil	746
<i>Dupleix</i>		10,000	636	6	63	0	20	7	90,000	Brest	1929	1931	1,450,000	..	..	8 8-in., 8 3·5-in. A.A., 6 1-pr., 12 M., 3 sea-planes, 2 catapults.	21·7	32	oil	605
<i>Foch</i>		10,000	636	6	63	0	20	7	90,000	(G.)	1928	1931	1,270,000	..	..	8 8-in., 8 3·5-in. A.A., 6 1-pr., 12 M., 3 sea-planes, 2 catapults.	21·7	32	oil	605
<i>Colbert</i>		10,000	607	0	63	0	20	7	90,000	Brest	1927	1930	1,210,000	..	..	8 8-in., 8 3·5-in. A.A., 6 1-pr., 12 M., 3 sea-planes, 2 catapults.	21·7	32	oil	605
<i>Suffren</i>		10,000	626	8	62	4	20	7	120,000	Lorient.	1926	1928	..	..	..	8 8-in., 8 3·5-in. A.A., 8 1-pr., 2 seaplanes, 1 catapult	21·7	33·2	—	620
<i>Tourville</i>		10,000	626	8	62	4	20	7	120,000	(G.) Brest	1923	1926	..	..	..	8 6·1-in., 4 3-in. A.A., 2 3-pr., 2 M., 1 L., 1 seaplane, 1 catapult	21·7	33	—	578
<i>Duquesne</i>		7249	594	10	56	6	17	0	110,000	Brest	1924	1927	..	..	..	8 6·1-in., 4 3-in. A.A., 2 3-pr., 2 M., 1 L., 1 seaplane, 1 catapult	21·7	33	—	578
<i>Duguay-Trouin</i>		7249	594	10	56	6	17	0	110,000	Lorient	1924	1927	..	..	..	8 6·1-in., 4 3-in. A.A., 2 3-pr., 2 M., 1 L., 1 seaplane, 1 catapult	21·7	33	—	578
<i>Primauguet</i>		7249	594	10	56	6	17	0	110,000	La Motte Piquot	1924	1927	..	..	..	8 6·1-in., 4 3-in. A.A., 2 3-pr., 2 M., 1 L., 1 seaplane, 1 catapult	21·7	33	—	578

er.	<b>Metz (ex-German Königsberg)</b>	5264	496 11' 47 0	16 6	36,400	Bremen(Weiser)	1915	1916	..	24	1	8 5·9-in., 2 3-in. A.A., 4 M.	2200 22-w.	27	1270	433
"	<b>*Strasbourg (ex-German Regensburg)</b>	4723	468 1 45 0	17 0	26,000	Bremen(Weiser)	1914	1914	417,810	4-24	2	7 5·9-in., 1 3-in. A.A., 4 M., 120 mines.	4 197· a.w.	26·0	1200	438
"	<b>Thionville (ex-Austrian Novara)</b>	2922	428 7 42 0	15 6	25,000	Fiume	.	1913	1914	..	24	..	9 3·9-in., 2 3-in. A.A., 1 M., twin a.w.	27·0	800	430
M.Cr.	<b>Emilie Bertin</b>	5886	580 0 52 5	16 4	100,000	Penhoet, St. Nazaire	1983	Bldg.	..	..	..	9 6-in., 4 3·5-in. A.A., 8 I-pr., 250 M., 1 catapult, 2 aircraft.	6 34·0 a.w. (T.)	—	oil	550
"	<b>Pluton</b>	4773	498 9 49 9	17 0	57,000	Lorient	.	1929	1931	..	..	..	4 5·5-in., 10 I-pr., 12 M., 1000 mines.	30·0	oil	..

• To be sold.

RIVER GUNBOATS.—Francis Garnier (1929), 639 tons, 15 knots, two 4-in., one 3-in. A.A.; Vigilante, Argus (1924), 177 tons, 12 knots, two 3-in. A.A.; Doudart de Lagrée (1906), 265 tons, 14 knots; Mytho, Toulano (building at Sargon), 100 tons, 250 H.P. (Diesel), 14 knots, one 3-in.; La Grandière (1921), 39 tons, 11 knots; Jouffroy d'Abbans, 400 tons, 15 knots, 2·3 in., building, 10 knots, one 3 in. GUNBOAT.—Jouffroy d'Abbans, 400 tons, 15 knots, 2·3 in., building.

MINESWEEPERS.—Conquérante (1918), 374 tons, 17 knots, two 3·9-in.; Lorraine (1917), 265 tons, 13·8 knots, two 3·9-in.; Impétueuse, Bataillense, Audacieuse (1917), 265 tons, 15 knots, two 3·9-in.; Engagante, Diligente (1917), 360 tons, 17 knots, two 3·9-in.; Ariege, Inconstant, Ardent (1916), 310 tons, 17 knots, two 3·9-in.; Sans-Souci, Étouïdi, Algerie, (1916), 310 tons, 17 knots, two 3·9-in.; Gracieuse, Capricieuse, Dédaignouse, Tapageuse, Surveillante (1916), 315 tons, 15 knots, two 3·9-in.; Granit, Mica, Meulière, Quartz (1918), 354 tons, 12·5 knots, one 9-pr. MINELAYERS.—Castor, 3,150 tons, 14 knots, three 3·9-in., two 1·5 A.A.; Pollux, 2,460 tons, 14 knots, three 3·9-in., two 1·5 A.A.; Jules Verne (1931), 5,747 tons, 7,000 H.P. (Diesel), 16 knots, mounting four 3·5-in. A.A., four 1-pr. A.A. SUBMARINE PARENT SHIP.—Dumont D'Urville, Savorgnan de Brazza, and d'Entrecasteaux (1932-1933), Rigault-de-Genouilly Amiral Charner, and D'Iberville, 1970 tons, 3,000 H.P. (Diesel), 15·5 knots, armament three 5·5-in., four 1-pr. A.A., 6 M., 50 mines, 1 seaplane. Ville d'Ys (1917) (on fishery protection duties), 1122 tons, 17 knots, mounting three 3·9-in., three 3-in., 2 M.; Régulus (1917), Antares, Aldébaran, Bellatrix, Algol, Altair (1916), 1122 tons, 17 knots, mounting two 5·5-in., two 3-in.

A.A., 2 M. DESPATCH VESSELS.—Du Couedic, Enseigne Henry, Duperré, Duchaffault, Dubondien, 1919-1920, 458 tons, 17 knots, one 5·5-in., one 8·9-in.; Mondement, Monimtrial, Remiremont, Bethune, Viry-le-Francois, Lévin, Calais, Lassigny, Les Eparges, Vauquois, Vimy, Craonne, Ypres (ex-Dunkerque), Epinal, Nancy, Couey, Lafaux, Amiens, Toul, Tahure, Arras, Bapaume, Reims, Paronne, Lureville (1919-1923), 644 tons, 20 knots, two 5·5-in., one 3-in. A.A.; Escat, Ailette, Ancre, Scarpe, Sniipe, Menie, Yser, Somme, Oise, Aisne, Marne (1917-1919), 570-694 tons, 21 knots, four 3·9-in. Quentin-Roosevelt (on fishery protection duties), 586 tons, 13 knots, one 3-in gun.

NER-LAYERS.—Le Gladiateur, is being built at Lorient, 2,300 tons, 887 feet long, 7,700 H.P., 20 knots, four 3·5 in. A.A., 6 M. A second is projected. ECOEURS (Convoy Sloops).—Bayonnaise, Cordelière, Poursuivante, Incomprise, Malpomene, Flore, Pomone, Iphigenie, Branle-Bas, Bombarde, Bouclier and Batiste (building), 600 tons, two 3·5-in. guns, 16-in. t.t., 30 knots.

SURVEYING SHIPS.—Amiral Mouchez (building), 800 tons, 12 knots. La Pérouse and Beaufort-Baupré (1920), 1000 tons, one 3-in. A.A. Astrolobe, Octant, and Gaston-River (1918), 450 tons, 10 knots; Sonde (1911), 50 tons; Chimère (1910), 330 tons, 14 knots; Utile (1893), 450 tons, 13 knots. C.M.Bs.—V.T.B.1 (1922) (55 feet), 10 tons, 37 knots; V.T.B.1 (1921) (50 ft.), 5 tons, 37·6 knots. Ten building.

**SMALL CHASERS.**—No. 1-4 (building), 148 tons, 2,400 H.P., 20 knots, one 3-in gun. Twenty-seven in number (1918), 70 tons, 16 knots, one 3-in gun.

## GERMANY.—Battleships.

Class.	NAME.	Norm. Dispacement, (tons.)	Beam. (Extreme), Length, ft. ins.	Draught, ft. ins. ft. ins.	Horse-Power, Type of Machinery and Boilers.	Date of Launch, Date of Completion.	Where Built.	Armour.				Armament.				Complement. Oil.				
								Belt.	Deck above Belt	Bulkhead	Guns.	Position.	Heavy Guns.	Second Heavy Guns.	Torpedo Tubes.					
b.*	Deutschland †	10,000 (stan- dard)	67 6 19	0	54,000 -56,800 Diesel	1931 1933 1934	Deutsche Werke, Kiel Wilhelms- haven	estimated 3,750,000 estimated 3,380,000 estimated 3,530,000	2	In.	In.	In.	In.	In.	6 11-in., 8 5·9-in., 6 3·4-in. A.A., 8 1-pr.	197" (Q.)	26	—	1200	634
b.*	Admiral Scheer †	13,040 413	172 10 25	8	17,000 T.S. recip.	1905 (1907)	Wilhelms- haven	1,157,500	9½-4	3	8	6	10-6	6½	4 11-in., 14 6·7-in., 4 8·5-in. A.A., 4 3·5-in., a.w.	4	18	1771	727	
b.*	Admiral Graf Spee ††	12,988 413	572 10 25	3	16,000 T.S. recip.	1903 (Ger- mania)	Kiel (Ger- mania)	1,157,500	9-4	3	6	6	10-6	6	4 11-in., 12 6·7-in., 4 8·5- in. A.A., 23 M.	197"	18	1574	727	
b.	Hannover §	13,010 413	172 10 25	3	17,000 T.S. recip.	1906 (1908)	Schichau (Germania)	1,214,000	9½-4	3	8	6	11-6	6½	4 11-in., 12 5·9-in., 4 8·5- in. A.A., 23 M.	197"	18	1771	727	
b.	Hessen .															a.w.	187			
b.	Schlesien §																187			
b.	Schleswig- Holstein §																187			

\* Officially rated as "Armoured Ships."

† Formerly known as Ersatz Preussen.

‡ Formerly known as Ersatz Lothringen.

§ Reconstructed 1925-30.

|| Consists of eight double acting two-stroke M.A.N. Diesels.

†† Formerly known as Ersatz Braunschweig.

A fourth armoured ship, Ersatz Elsass, was due to be laid down at Kiel in 1934. It is reported that she may be turbine driven.

A fifth, Ersatz Hessen, is reported to have been ordered at Wilhelmshaven.

# GERMANY.—Cruisers.

Class.	Name	Where Built.	Maker of Engines.	Armour.				Torpedo Tubes.	Speed. Knots.	Fuel. Coal Oil.	Complement
				Cost.	Belt.	Gun Position.	Guns.				
I.c.	<b>Leipzig</b> .	Wilhelmshaven	..	1929	1931	2,050,000	3-4	9 5·9-in., 4 3·4-in. A.A.	32 19·7-in. a.w.	— 1500 (In- clud- ing Diesel oil)	534
I.a.	Nürnberg .	Kiel	..	1934	1930	1,785,000	..	..	..	..	..
I.o.	Köln .	Wilhelmshaven	..	1928	1930	1,785,000	..	..	..	..	..
I.c.	Karlsruhe	Deutsche Werke, Kiel	..	1927	1929	1,985,000	3-4	9 5·9-in., 4 3·4-in. A.A.	32 19·7-in. a.w.	— 1200	500
I.c.	Königsberg	Wilhelmshaven	..	1927	1929	2,100,000	..	8 5·9-in., 2 3·4-in. A.A.	2 twin 19·7-in. a.w.	29 700	483
I.c.	Emden *	Wilhelmshaven (G.)	..	1925	1925	..	3	..	..	..	..
I.c.	Berlin	Danzig	..	1903	1905	..	..	8 4·1-in.	22 19·7-in. a.w.	846 —	349

**GUNNERY TRAINING SHIPS.**—Drache (1909), 778 tons, 16 knots, 4 4·1-in.; Finch (1919), 517 tons, 16 knots, 2 4·1-in.; Delphin, 517 tons, 16 knots, Gunney Tender Bruse (formerly known as Ersatz Drache) (Wilhelmshaven, 1932), 1,230 tons, 35½ feet long, 31 ft. 2 in. beam, 25,000 H.P. (Diesel), 27 knots, 4 4·1-in. guns, complement 112. A second new Gunney Tender, Ersatz Hay, is authorised (to be laid down in 1936).

**FISHERY PROTECTION VESSELS.**—Weser and Elbe (Wilhelmshaven, 1931), 590 tons, 1600 H.P. (Diesel), 15 knots; Zielen (1919), 541 tons, 17 knots.

**EXPERIMENTAL VESSELS.**—Pelican and Nautilus (500 tons, 17 knots), Grille (470 tons, 10 knots). Minisweepers.—29 in number (reciprocatting machinery). 475-525 tons, 16 knots. Six are projected to commence in 1935.

**SAILING TRAINING SHIP.**—Gorch Fock (Hamburg, 1933) (replacing the Niobe). Three-masted barque, 239 feet in length, 1,500 tons, 500 H.P. auxiliary motor giving 8 knots.

**BARRAGE CRAFT.**—R 1-8 (1933), 85 ft., 44 tons, 700 H.P., 17½ knots. Mining and Barrage vessels MT 1 and 2, 550 tons, 10 knots; 12 small craft.

**PATROL OR GUARD BOATS.**—S 1-6 (1932), 92 ft., 46 tons, 2,400 H.P., 31½ knots. UZ 27-35, 102 ft., 60 tons, 500 I.P., 14 knots.

**TARGET SHIP.**—Zähringen (ex-battleship), 11,800 tons. Wireless controlled. TARGET TUGS AND CONTROL SHIPS.—Pfeil and Blitz, 650 tons. Blitz is control ship for Zähringen.

**FLEET TENDERS.**—Hela, Nordsee. STATION TENDERS.—Nixe, Frauendorf.

**SURVEYING VESSELS.**—Metor (1924), 1150 tons, and two surveying launches, 90 tons.

† Three propeller shafts, of which the centre shaft is Diesel-driven and the outers turbine-driven. Diesels used for cruising or combined with the turbines to give full speed.

‡ Parsons geared turbines with Diesels for cruising.

# GREECE.

Class.	NAME.	Where Built.	Cost.	Armour.				Guns.	Torpedoes.	Speed. Knots.	Coal/ Oil.	Complement.
				Belt.	Deck.	Side above Belt.	Bulkhead.					
a.s. Giorgios Averoff *	9301 462	24 2/3 (21,500 t)	19,000 Leghorn (Orlando) B.	1910 1911 1,100,000	8-3½ in. K.S.	7 in. 7 in. 7 in.	8-6½ in.	7	4-9·2-in., 8·7·5-in., 16·3-in., 4-3-p.r., 2-3-in. A.A., 2 M.	3 (sub.) 18·4 in.	knos. 22½ (24 t.)	ton. 1500 ..
or. Helle † (ex Fe-Hung)	2083 322	39 14	6000 P.T. (G.)	1912 Camden, N.J.	240,000	..	14	..	.. 3 6-in., 1 3-in. A.A., 110 mines	2 a.w. 13 in.	knos. 1500 ..	ton. 100 ..

\* Retubed and refitted 1927.

† Repaired and converted to oil burning in France and fitted as a minelayer in 1929.

Old gunboat (gunnery school tender), Amvrakia, 470 tons. Training ship, Areo, 1,870 tons, four 3-in. guns, completed at Chantiers de la Méditerranée, la Seyne, 1929. Repair ship, Hephaestus (1920), 4,548 tons gross, 11½ knots. Surveying ship (old sloop), Nautilus, 400 tons, 11 knots, two 8-in. guns. Dispatch vessels, Koroglia Lenios (1916), 380 tons, 13½ knots, and Kichli (1884), 86 tons, 10 knots. C.M.B's., two Thornycroft type, 55 ft. 4 built at Venice, 69 ft., for Customs Service. One light cruiser projected.

# ITALY.—Battleships.

NAME.	DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY (1922).*	Class.	Squadron.	Displacement.	Beam.	Draught.	Horse-Power.	Type of Machinery and Boilers.	Date of Launch.	Where Built.	Armour.				Armament.			Fuel.	Speed.	Complement.					
											Cast.	Belt.	Deck.	Sides above Belt.	Gun Position.	Heavy Guns.	Second Art.	Torpedoes.	Guns.						
b. <b>Andrea Doria</b> †	1937	21,555	575	9	92	0	29	P.T. Y. 31,000 P.T. Y.	1913	Spesia	..	10-4 K.S.	14 K.S.	..	9½ K.S.	6 K.S.	13 2 catapult, 1 aircraft	12-in., 16 3-in., 6 2-pr., 6 catapult, 1 aircraft	5-in., 13 M., 4 L., 1 12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	12-in., 16 3-in., 6 2-pr., 2 catapult, 1 aircraft	2	21	120	1074	
b. <b>Caio Duilio</b> †	1936	21,603	577	4	92	0	29	P.T. B. 31,000 P.T. B.	1913	Castellammare	..	10-4 K.S.	14 K.S.	..	9½ K.S.	6 K.S.	13 2 catapult, 1 aircraft	12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	5-in., 13 M., 4 L., 1 12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	12-in., 16 3-in., 6 2-pr., 2 catapult, 1 aircraft	2	22	143	1074	
b. <b>Conte di Cavour</b> †	1936	21,818	577	5	92	0	29	P.T. B. 31,000 (Ansaldo)	1911	Spesia	..	10-4 K.S.	14 K.S.	..	9½ K.S.	5 K.S.	13 2 catapult, 1 aircraft	12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	5-in., 13 M., 4 L., 1 12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	12-in., 16 3-in., 6 2-pr., 2 catapult, 1 aircraft	2	22	143	1074	
b. <b>Giulio Cesare</b> †	1935	8759	460	11	68	11	24†	P.T. B. & W. 21,000 recip. Belleville rep.	1907	Genoa (Orlando)	..	10-4 K.S.	14 K.S.	..	9½ K.S.	5 K.S.	13 2 catapult, 1 aircraft	12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	5-in., 13 M., 4 L., 1 12-in., 18 3-in., 6 2-pr., 2 catapult, 1 aircraft	12-in., 16 3-in., 6 2-pr., 2 catapult, 1 aircraft	2	22	143	1074	
b. <b>Pisa</b> †	.	9232	462	2	69	0	24†	P.T. B. 23,000 (19,000) rep.	1908	Leghorn (Orlando)	1909	..	8-3 K.S.	14 K.S.	..	6½ K.S.	4 K.S.	10-in., 8 3-in., 6 2-pr., 4 catapult, 1 aircraft	7-5-in., 12 3-in., 6 2-pr., 4 catapult, 1 aircraft	7-5-in., 12 3-in., 6 2-pr., 4 catapult, 1 aircraft	7-5-in., 12 3-in., 6 2-pr., 4 catapult, 1 aircraft	2	23	148	687
b. <b>San Giorgio</b>	.	9350	462	2	69	0	24†	P.T. B. (1910) (1911)	1910	Castellammare	..	8-3 K.S.	14 K.S.	..	7-6 K.S.	7 K.S.	10-in., 8 3-in., 6 2-pr., 6 catapult, 1 aircraft	7-5-in., 10 3-in., 6 2-pr., 6 catapult, 1 aircraft	7-5-in., 10 3-in., 6 2-pr., 6 catapult, 1 aircraft	7-5-in., 10 3-in., 6 2-pr., 6 catapult, 1 aircraft	2	23	158	643	
b. <b>San Marco</b> **	.	462	2	69	0	24†	P.T. B. (1910) (1911)	1911	Castellammare	..	8-3 K.S.	14 K.S.	..	7-6 K.S.	7 K.S.	10-in., 8 3-in., 6 2-pr., 6 catapult, 1 aircraft	7-5-in., 10 3-in., 6 2-pr., 6 catapult, 1 aircraft	7-5-in., 10 3-in., 6 2-pr., 6 catapult, 1 aircraft	7-5-in., 10 3-in., 6 2-pr., 6 catapult, 1 aircraft	2	23	158	643		

\* The London Naval Treaty (1930) suspended the replacement of capital ships during the years 1931-36 inclusive. † Cadets training ship. To be boys' training ship. ‡ To be completely modernised. Reported that centre triple turret will be removed and speed to be increased to 26 knots.

§ Armoured Cruisers, classified as Battleships, 2nd class, in Italian Official Lists. \*\* Being converted into target ship under wireless control.

Two 35,000-ton battleships were laid down on October 28, 1934, orders having been placed with Ansaldo, Genoa, and San Marco Works, Trieste, respectively, to be named Vittorio Veneto and Littorio.

## ITALY.—Cruisers, &amp;c.

Name.	Standard Displacement.	Length (Extreme).	Beam.	Draughts.	Horse-Power, Tonnage and Machinery.	Where Built.	Cost.	Gun Position.	Armour.		Torpedo Tubes.	Speed, knots.	Fuel, Coal, Oil.	Complement.
									Cost.	Side, Deck.	Guns.			
Improved Condottieri Class	6791	593 8	57 5	15	110,000	Cantieri Biunni di Trieste Odero-Terni, Orlandi Spezia	Bldg. ...	... ..	8 6-in., 6 3.9-in., 8 1-pr. A.A., 8 M.	6 21"	36½	..	..	
Attendolo Class	6791	613 4	57 5	15	110,000	Orlando, Leghorn	Bldg. ...	.. ..	8 6-in., 6 3.9 in., 8 1-pr. A.A., 8 M.	6 21"	36½	..	..	
Zara Class	10,000	600 0	67 8	20·2	95,000	Orlando, Leghorn (G.)	1931	Abt. 6	8 8-in., 16 3.9-in. A.A., 16 smlr, 1 catapult, 2 aircraft	— (33 t.)	32	oil	840	
Condottieri Class	5857	597 0	54 6	14·2	110,000	Trieste (G.)	1933	.. ..	8 6-in., 6 3.9-in. A.A., 8 1-pr. A.A., 8 M.	8 21"	37	oil	..	
Zara Class	10,000	600 0	67 8	20·2	95,000	Orlando, Leghorn	1930	Abt. 6	8 8-in., 16 3.9-in. A.A., 12 smlr, 1 catapult, 2 aircraft	21"	34	oil	840	
Modified Condotti Class	10,000	646 0	67 8	..	150,000	Ansaldo, Genoa (G.)	1932	.. ..	8 8-in., 16 3.9-in. A.A., 12 smaller, 1 catapult, 2 seaplanes.	21"	36	oil	..	
Armando Diaz	5008	554 6	50 10	14	95,000	Odero-Terni, Spazio Stabilimento Tecnico Trieste (G.)	1931	.. ..	8 6-in., 6 3.9-in. A.A., 8 M. 1 catapult, 2 seaplanes	4 21" (393 t.)	37	oil	..	
Luigi Cadorna	10,000	599 10	67 8	20·2	95,000	Odero-Terni, Mugnano Stabilimento Tecnico Trieste (G.)	1930	.. ..	8 6-in., 16 3.9-in. A.A., 16 smaller, 1 catapult, 2 aircraft	—	32	oil	800	
Zara Class	Alberto di Gius- sano	556 5	50 10	14·2	95,000	Ansaldi, Sestri- Portente (G.)	1931	.. ..	8 6-in., 6 3.9-in. A.A., 8 1-pr. 8 M., 1 catapult, 2 seaplanes	4 21" (D.)	37	oil	500	
Condotti Class	Castellamare	5069	556 5	50 10	95,000	Castellamare	1932	.. ..	8 6-in., 6 3.9-in. A.A., 8 1-pr. 8 M., 1 catapult, 2 seaplanes	—	32	oil	800	

**Ex-merchant ship taken over on the stocks.**

\* Ex-merchant ship, taken over on the stocks.  
† Fleet Flagship.  
‡ Classified as Scouts in Italian Lists.

**COMBINED MINELAYERS AND MINEWREPPERS.**—*Fasana*, *Buccari*, *Durazzo*, and *Dilegosa*, completed 1926-31, 11 knots (L.C. machinery), 1 J.-in. gun, 200 mines; **MINELAYERS.**—*Marghera* and *Brondabø*, 117 tons, 13 knots, 60 mines; **AEGO.**—*Legnano*, *Lepanto*, and *Ostia*, completed 1926-7, 615 tons, 15 knots (reinp.), 24-in., 13-in., 100 mines; **MINELAYERS.**—*Milazzo*, and *Albona* (*ex-Austrian*), 112 tons, 11 knots, 13-in.

**MINESWEEPERS.**—Cotrone, Vietti, 475 tons, 13·8 knots, 2 4-in. guns; 38 in No. 200 tons, 14 knots, 1 3-in. gun.  
**ON TRANSPORTS.**—Marte, Dalmazia, Istria, Livenza, Urano, Prometeo, Coito, Leto, Stige, Niobe, Cerere, Giove, Tarvio, Quarnero. Oil transport with under-water protection, Brennero, 10,000 tons, 10 knots.  
**GUINBOATS.**—Armondi (1910), 432 tons, 9 knots, 2 3-in. A.A. guns.  
**ESCORPION BOATS.**—A. Badile, T. Farinatti, E. Giovannini, C. del Greco, and A. Vitturi (1922), 182 tons, 23 knots, 2 4-in. guns, 2 T.T.  
**SURVEYING VESSELS.**—Ammiraglio Mazzinghi (1914), 1800 tons, 14 knots; Cardilli (1916), 330 tons, 10 knots; Scilla (1916), 350 tons, 11 knots; Tritone (1915), 340 tons, 10 knots.  
**42 ARMED MOTOR BOATS (M.A.S.)** built and 6 under construction.

**PATROL VESSELS.**—Cherso and Lusin (1912), 4,000 tons, 10½ knots; Lante and Bianco (1917), 280 tons, 12 knots; Lutti and Cirene (1912), 340 tons, 10 knots; Corini (1912), 290 tons, 12 knots; Rimini (1912), 319 tons, 9½ knots; Gallipoli (1911), 310 tons, 10½ knots; Ortranto (1911), 290 tons, 10 knots; Giannutri (1912), 680 tons, 13 knots; Alula (1912), 308 tons, 13 knots.

**CABLE SHIP.**—Oltà di Milano (5,500 tons), 10 knots.  
One submarine chaser, Albatross, 340 tons, 24 knots, 2 3/8-in. and 1 1/2-in. A.A. building at Palermo.

## JAPAN.—Battleships.

NAME.	DATE FOR SCRAPPING AND RE- PLACEMENT UNDER WASHINGTON TREATY (1922).*	Type. Scrap metal unit. (Extreme). Length (ft.). Displacement. Standard. Tons.	Where Built. Date of Launch. ft. ins. 0'94	Cost. ft. ins. 6'000	Belt. ft. ins. 0'28	Deck. ft. ins. 0'28	Side above Waterline. ft. ins. 0'28	Bulwarks. ft. ins. 0'28	Gun Position. Heavy Guns. Second. Art'y.	Guns. In.	Armament.			Fuel. Coal. Oil. tons.	Speed. knots. 22.5	Torpedo Tubes. 21-in.	Complement. 1300	
											Guns. In.	Guns. In.	Torpedo Tubes. 21-in.					
Fusō §	1937	Fuso Class	Kure . 1914 1915	40,000 B.C.T.	..	12·4	3	8	..	12	14-in., 16 6-in., 8 5-in. A.A., 4 M., 4 L., 1 sea- plane	2	22.5 (sub.) 21-in.	4000 1300	—	1300		
Hyuga . 1940	29,990 683	Ise Class	Nagasaki (Mitsubishi) 1917 1918	45,000 B.C.T.	..	12·4	3	8	..	12	14-in., 18 5·5-in., 4 3-in. A.A., 2 M. H.A., 2 sea- planes, 1 catapult (D)	6	23 (sub.) 21-in.	4500 1300	1360	—		
Yamashiro § 1938	29,380 673	Haruna † 1935	Kobe . (Kawasaki) 1916 1917	40,000 B.C.T.	..	12	3	8	..	12	14-in., 18 5·5-in., 6 3-in. A.A., 2 M. H.A., 2 seaplanes	6	23 (sub.) 21-in.	4500 1300	1360	—		
Kirishima † 1936	29,380 704	Kongo † 1934	Yokosuka 1915 1917	40,000 B.C.T.	..	12	3	8	..	12	14-in., 16 6-in., 8 5-in. A.A., 4 M., 4 L., 1 seaplane (D)	6	22.5 (sub.) 21-in.	4000 1300	1272	—		
Mutsu † . 1942	32,720 700	Nagato † 1941	Kobe . (Kawasaki) 1913 1915	64,000 P.T.	..	8·3	23	6	..	10	8 14-in., 16 6-in., 8 5-in. A.A., 4 M., 4 L., 1 sea- plane	4	26 (sub.) 21-in.	—	1250	—		
				64,000 Barrow	1912 1913 2,500,000										4000	—	—	
				P.T.														

ARMOURED CRUISELS now rated as ('OAR-T-DEFENCE SHIPS (1st class), completed 1889-1904: Nisshin, 7080 tons, 20 knots, 4 8-in., 14 6-in.; Kasuga, 7080 tons, 20 knots, 1 10-in., 2 8-in., 14 6-in.; Yukino, 9010 tons, 20 knots, 4 8-in., 12 6-in.; Aizuma, 8640 tons, 20 knots, 4 8-in., 12 6-in.; Idzumo and Iwato, 9180 tons, 16 knots, 4 8-in., 14 6-in.; Asama, 9240 tons, 21½ knots, 4 8-in., 12 6-in.; Tsurumi (2nd class), 3120 tons, 20 knots, 6 6-in., 8 3-in., 1 3-in. A.A.

\* Modernised 1934.

† Being modernised.  
‡ Modernised 1928-1931, including fitting of bulges and new forecastle, and conversion to oil burning. Hiyoi of this class has been de-militarised and converted to a training ship in accordance with London Naval Treaty.

## JAPAN.—Aircraft Carriers.

Class.	Name.	Length. (Extreme).	Displacement. Standard.	Beam.	Draught.	Where Built.	Date of Launch.	Date of Completion.	Cost.	Side Deck.	Gun Position.	Armament.		Torpedo Tubes.	Speed.	Fuel. Coal. Oil.	tonnes.	knots.	Complement.
												Guns.	Torpedoes.						
A.C.	Akagi*	26,900	763	ft. ins. 21 2	131 200 (G.)	Kure	1925	1927	£	In.	..	10 8-in., 12 47-in. A.A., capacity for 50 aircraft. Carries about 30 aircraft.	—	—	28.5	4000	..	..	
A.C.	Hoshō†	7470	510	48	15 0	30,000 (G.)	Tsurumi (Asano)	1921	1922	..	..	..	4 5.5-in., 2 3-in. A.A., 20 aircraft	—	—	2.5	—	550	..
S.C.	Kamoi §	17,000	495	67	28 0	8,000 turbines and electric drive	New York S.B. Co.	1922	1922 (converted 1933)	..	..	..	2 5.5-in., 16 seaplanes	—	—	15	4000	..	..
A.C.	Kaga‡	26,900	715	102½	22 1	91,000 Kobe	(Kawa- saki)	1921	1928	..	..	..	10 8-in., 12 47-in. A.A., capacity for 60 aircraft. Carries about 30 aircraft.	—	—	25	—	5300	..
S.C.	Notoro§	14,050	455	58	26 6	5,850 recip.	Kobe (Kawa- saki)	1920	1920	..	..	..	2 47-in., 2 3-in. A.A., 16 seaplanes	—	—	12	—	1000	..
A.C.	Ryūjō	7100	548	60 8	15 0	40,000 (G.)	Yokohama	1931	1933	..	..	..	12 5.5-in., A.A., 24 aircraft	—	—	25	oil	600	..

\* Designed as a battle cruiser. † Fitted with gyro-stabiliser. ‡ Converted from oiler. § Seaplane carriers. Other vessels carry landplanes.

## JAPAN.—Cruisers.

Class.	NAME.	Where Built.	Cost.	Armour.		Armament.		Speed. Knots.	Fuel. Coal. Oil.	Complement.
				Side, Deck.	Gun Position.	Guns.	Torpedo Tubes.			
—	Mogami Mikuma Suzuya Kumano	{ Kure Nagasaki Yokosuka	{ 1934 1934 Bldg. 2,500,000 estimated	in.	in.	15 6·1-in., 8 5-in. A.A.	..	33	..	..
Takao Class	Chokai. Maya. Atago. Takao	{ Nagasaki Kobe Kure Yokosuka	{ 1931 1930 1930 1932	..	..	10 8-in., 4 4·7-in. A.A., 2 M.	..	33	oil	692
Nachi Class	Ashigara Haguro M.Yoko. Nachi	{ Kobe Nagasaki Yokosuka Kure	{ 1928 1929 1929 1928	..	..	2 catapults, 2 seaplanes	21-in. a.w. (D.)	..	—	—
Furutaka Class	Kinugasa Aoba. Furutaka Kako	{ 10,000 95,000 95,000 Nagasaki Kawasaki, Kobe Kawasaki, Kobe	{ 1929 1927 1927 1928	..	..	10 8-in., 6 4·7-in. A.A., 2 M., 1 catapult, 2 seaplanes	12 21-in. (T.)	33	—	692
Chikuma Class	Hirado. Yahagi.	{ 7100 7100 595 51 b.p.	{ 1926 1926 1926 1926 1925	..	..	6 8-in., 4 4·7-in. A.A., 2 M., 1 ½ planes, 1 catapult	12 21-in. (T.)	33	400	604
Natori Class	Abukuma Isuzu. Nagara. Natori	{ 4400 4400 475 46½	{ 1911 1912 22,500 P.T.	..	..	6 8-in., 4 3-in. A.A., 2 M., 1 catapult	12 21-in. a.w.	..	—	—
		{ 5170 5170 53.5 47½	{ 1923 1921 1922 1922	..	..	8 6-in., 2 3-in., 2 3-in. A.A., 2 M.	26 18-in. a.w.	900 300	410	450
						7 5·5-in., 2 3-in. A.A., 2 M., 1 seaplane, 1 catapult	8 21-in. a.w. (D.)	33·0 300 1260	300	450

Natori Class	Yura	·	5170	635	47 $\frac{1}{4}$	15 $\frac{3}{4}$	1922	1923	8	21-in.	33·0	300	450	
Kinu	·	·	{ 5170	{ 635	{ 47 $\frac{1}{4}$	{ 15 $\frac{3}{4}$	{ Sasebo	{ 1922	{ 1922	{ 1 seaplane, 1 catapult	{ a.w.	{ 300	{ 450	
Jintsu	·	·	{ 5195	{ 535	{ 47 $\frac{1}{4}$	{ 15 $\frac{3}{4}$	{ 90,000 (G.)	{ Kawasaki	{ 1923	{ 1925	{ 7 5·5-in., 2 3-in. A.A., 2 M.,	{ 21-in.	{ 1260	{ 450
Naka	·	·	{ 5195	{ 535	{ 47 $\frac{1}{4}$	{ 15 $\frac{3}{4}$	{ 90,000 (G.)	{ Kawasaki	{ 1925	{ 1925	{ 1 seaplane, 1 catapult	{ a.w.	{ 300	{ 450
Sendai Class	·	·	{ 5195	{ 535	{ 47 $\frac{1}{4}$	{ 15 $\frac{3}{4}$	{ 90,000 (G.)	{ Yokohama	{ 1925	{ 1925	{ 7 5·5-in., 2 3-in. A.A., 2 M.,	{ 21-in.	{ 1260	{ 450
Kiso	·	·	{ 5195	{ 535	{ 47 $\frac{1}{4}$	{ 15 $\frac{3}{4}$	{ 90,000 (G.)	{ Nagasaki	{ 1925	{ 1924	{ 1 seaplane, 1 catapult	{ a.w.	{ 300	{ 450
Kitakami	·	·	{ 5195	{ 535	{ 47 $\frac{1}{4}$	{ 15 $\frac{3}{4}$	{ 90,000 (G.)	{ Sasebo	{ 1920	{ 1921	{ 7 5·5-in., 2 3-in. A.A., 2 M.,	{ 21-in.	{ 1260	{ 450
Kuma Class	Kuma	·	5100	535	47 $\frac{1}{4}$	15 $\frac{3}{4}$	1920	1921	2	—	7 5·5-in., 2 3-in. A.A., 2 M.,	8	33·0	300
Oi	·	·	5100	535	47 $\frac{1}{4}$	15 $\frac{3}{4}$	1920	1921	—	—	1 seaplane, 80 mines	21-in.	a.w.	300
Tama	·	·	5100	535	47 $\frac{1}{4}$	15 $\frac{3}{4}$	1920	1921	2	—	7 5·5-in., 2 3-in. A.A., 2 M.,	8	33·0	300
Tenryu Class	Tatsuta	·	3230	468	40 $\frac{3}{4}$	13	51,000 (G.)	Sasebo	1918	1919	4 5·5-in., 1 3-in. A.A., 2 M.,	6	31	300
—	Tenryu	·	2890	435	39 $\frac{1}{2}$	11 $\frac{3}{4}$	57,000 b.p.	Yokosuka	1923	1923	Fitted for minelaying. 6 5·5-in., 1 3-in. A.A., 2 M.,	6	33	300
—	Yubari	·	—	—	—	—	—	—	—	84 mines	21-in.	a.w.	328	
											(D.)			

\* A replenishment programme of new construction is projected to cover a period of 3 or 4 years and comprising 2 cruisers (8500 tons), 2 aircraft carriers (10,000 tons), 14 destroyers (1400 tons), 6 submarine tenders (of a total tonnage of 7300 tons), a minelayer (5000 tons), 8 torpedo boats.

MINELAYERS.—Matsushima (440 tons), building at Ishikawajima; Sarushima, building at Yokohama; Nashimi, building at Harima; Katsuriki (1917), 1540 tons, 13 knots, 3 3-in., 150 mines; Itsukushima (Uruga, 1929), 1970 tons, 16 knots, 3000 h.p. (Diesel), 3 5·5-in., 2 3-in. A.A.; Tokiwa, 9240 tons, 21 knots, 2 8-in., 8 6-in., 3 3-in., and 17 smaller vessels, 300—400 tons, about 12 knots. A minelayer of 5000 tons is projected.

MINESWEEPERS.—Nos. 1, 2, 3 (1923), No. 4 (1925), and Nos. 5, 6 (1929), 615 tons, 2 4·7-in., 1 3-in. A.A. Nos. 9, 10 (1918), 770 tons, 24 knots, 2 4·7-in.; Nos. 13—14 (1933), and Nos. 15—16 (Building), 492 tons, 2 4·7-in. guns, and Nos. 17 and 18 are projected.

GUNBOATS.—Saga (1912), 685 tons, 15 knots, 1 4·7 in., 3 3-in. A.A.; Uji (1903), 540 tons, 13 knots, 4 3-in., 2 3-in. A.A.

RIVER GUNBOATS.—Futani (1930), Atami (1929), 170 tons, 16 knots, 1 3-in. gun, Katata, Hira, Hodzu, Seta (1923), 305 tons, 16 knots, 2 3-in. A.A.; Toba (1911), 21·5 tons, 15 knots, 2 3-in.; Fushimi (1906), 150 tons, 14 knots, 2 6-pr.; Sumida (1906), 10·5 tons, 13 knots, 2 6-pr.; and Kotaka (1930), 50 tons, 15 knots, 5 M.G.

SUBMARINE DÉPÔT SHIPS.—Taigai (building at Yokohama), 10,000 tons, 689 feet, 13,000 H.P., 20 knots, 4·5-in. A.A.; Chōgei (1924), Jingei (1923), 5160 tons, 16 knots, 4 5·5-in.; Komashashi (1914), 1230 tons, 13·9 knots, 2 3-in., 1 3-in. A.A.; Karasaki (1896), 9750 tons, 13 knots, 1 3-in., 1 3-in. A.A.

ANTI-SUBMARINE NETLAYERS.—Yazeyama (1932), 1135 tons, 4800 h.p. (reciprocating machinery), 20 knots, 2 4·7-in., 1 3-in. A.A.

SUBMARINE CHASERS.—Two building at Ishikawajima. Reported to be 300 tons, 24 knots.

REPAIR SHIP AND SUBMARINE SALVAGE SHIP.—Asahi (ex-Battleship, 12,000 tons).

Salvage Ships.

Cable Ships.

Transports and other auxiliaries.

# NETHERLANDS.

Class.	Name.	Where Built.	Cost.	Armour.				Armament.				Fuel. Coal. Oil.	Speed. knots.	Complement.	
				Belt.	Deck.	Side above Belt.	Bulkhead.	Guns.	Heavy Guns.	Second- ary Guns.	Air- craft.				
cr.	Celebes **	•	tons ft. ft. fl. fl.	70,000 Rotterdam P.T. Y.	• Bldg. est. 1935	3	..	..	..	..	..	6.5·9-in., 4·2-in. A.A., 4 M., 1 catapult, 2 seaplanes	32 ..	450	
cr.	Java *	•	6670 509½ 52½ 18	65,000 Flushing	1921 1925	..	3	..	..	..	..	10·5·9-in., 4·3-in. A.A., 8 M., 40 mines, 2 seaplanes	30 1070	490	
"	Sumatra *	•	•	{ Amsterdam	1920 1926	..	3	..	1	..	4	..	..	—	—
a.g.b.	Brinio	•	540 172½ 28 9½	1200 Amsterdam	1912 1914	..	2	..	..	..	..	4·4·1-in., 2 M.	—	14	
"	Friso	•	•	Diesel	1913 1915	K.S.	3	..	..	..	..	..	—	34	
"	Hertog Hendrik §	•	4371 317 50 19	6282 t. Amsterdam	1902 1903	347,500 6 H.N.S.	2	..	..	10	3	2·9·4-in., 6·5·9-in., 4·3-in., 1·a.w. 1·a.s. 1·9-pr., 4·1-pr., 2 M.	16·5 710 347	52	
"	Jacob van Heemskerk ¶	•	4445 321½ 50 19	6396 t. Amsterdam	1906 1908	347,500 6-4 H.N.S.	2	..	..	10	6	2·9·4-in., 6·5·9-in., 6·3-in., 1·9-pr., 4·1-pr., 2 M., 2 H.N.S. H.N.S.	16·5 520 351	—	
c.d.s.	Marten Tromp †	•	4,562 330 50 18½	6405 t. Amsterdam	1904 1906	317,500 6-4 H.N.S.	2	..	..	10	3	2·9·4-in., 4·5·9-in., 8·3-in., 1·9-pr., 4·1-pr., 2 M.	16·7 710 349	—	
"	De Zeven Provincien † * Not on sea-going list. (employed as training ship)	•	5644 333 56 20½	8516 t. Amsterdam	1909 1910	.. V. K.S.	2	..	..	10	4	2·11-in., 4·5·9-in., 10·3-in., 1·9-pr., 4·1-pr., 2 M.	16·3 885 409	—	

Ships marked \* above are in the East Indies Squadron.

\*\* For Indian Military Marine, to be renamed De Ruyter.

† To be replaced in 1935.

‡ To be replaced in 1938.

§ To be replaced in 1935.

|| To be replaced in 1935.

—

GUNBOATS.—(Indian Military Marine): Soemba, Flores (1926-7), and Johann Maurits van Nassau (1933), 1457 tons, 15 knots, three 5·9 in., one 3-in. A.A., 2 M.

MINELAYERS.—Nautilus (1930), used for fishery protection, 955 tons, 14 knots, one 3-in., two 1-pr., 2 M.; Douwe Aukes & Van Meerdant (1922), 749 tons, 13·5 knots, three 3-in. A.A., 2 M., 130 mines; Medusa and Hydra (1911), 670 tons, 11·5 knots, three 3-in., one 1-pr., 1 M., 65 mines; a new vessel authorised and eight old vessels attached to Indian Military Marine; Krakatau (1924), 1120 tons, 17 knots, two 3-in. A.A., 2 M., 150 mines, 1 catapult, and 1 seaplane; Pro Patria (1923), 605 tons, 11 knots, one 3-in. A.A., 2 M., 80 mines; Prins Van Oranje and Gouden Leeuw (1932), 1206 tons, 15 knots, two 3-in., and 1 aircraft; Rigel (1931), 1400 tons, 12½ knots, 160 mines; Heracles (1910), 188 tons, 10½ knots, and three old vessels.

MINESWEEPERS.—Ellierts de Haan, Hydrograaf, and in the Indian Military Marine; Cornelius Dribbel (1915), 787 tons, 170 H.P. (Diesel), 6 knots; and (in Indian Military Marine) Pelikaan (1922), 2600 tons, 1400 H.P.,

12 knots, four 2·75 in., 4 M. 4 C.M.B.'s. (Thornycroft 1928).

SURVEYING SHIPS.—Ellierts de Haan, Hydrograaf, and in the Indian Military Marine; Van Doorn, Van Gogh, Tydeman, and Wilibrord Snellius.

SUBMARINE DÉPÔT SHIPS.—Cornelius Dribbel (1915), 787 tons, 170 H.P. (Diesel), 6 knots; and (in Indian Military Marine) Pelikaan (1922), 2600 tons, 1400 H.P.,

12 knots, four 2·75 in., 4 M. 4 C.M.B.'s. (Thornycroft 1928).

OLD LIGHT CRUISER Gelderland (1901), 3966 tons, now used as gunnery training ship OLD GUNBOATS (1877-9): Hefring, 265 tons, Braga, Tyr and Freyr, 275 tons, 7-8 knots.

## NORWAY.

Class.	Name.	Displacement. (Extreme.)	Horse-Power.	Drayage.	Beam.	Length.	Date of Launch.	Cost.	Where Built.			Armor.			Armament.			Speed.	Fuel. Coal. Oil.	Complement.
									Belt.	Deck.	Side above Belt.	Bulwark.	Gun.	Heavy Guns.	Second Art.	Gun Position.	Torpedo Tubes.	Knobs.	tons.	
c.d.s.	Eidsvold (Norge)	4166	310½	50½	16½	4500	Elswick	1900/1901	350,000	6	2	..	..	6	2	8·2-in.	6 5·9-in., 8 3-in., (sub.) 18-in	2 16·5	550	270
"	Harald Hær- fagre Tordenskjold*	3860	30½	48½	16½	4500	Elswick	1896/1898 1897/1899	300,000	7	2	..	..	8	..	2 8·2-in., 6 3-in.	2 8·2-in., 6 4·7-in., 6 3-in., 2 3-in. A.A., 6 M.	3 16·5	550	240

FISHERY PROTECTION VESSELS: Fridtjof Nansen (1931), 1050 tons, 15 knots, 2000 H.P., two 2-pr., two 4-in., four 12-pr.; Heimdal (1892), 860 tons, 12 knots; four 12-pr.; and Michael Stars. MINELAYERS: Frøya (1918), 760 tons, 22 knots, 4·4-in., 100 mines; Glommen and Laugen (1918), 335 tons, 9½ knots, 150 mines; old gunboats, refitted as minelayers, Tyr, Gor, Vidar, Brage, Nor, Vale, and Uller, 230-280 tons, armed with one 4·7-in. and other guns. Olav Tryggrason,† minelayer and training ship, built at Horten, 1600 tons, 21½ knots, 6000 H.P., 4 4·7-in. and 1 3-in. A.A. guns, and 2 r.t.s. (18 in.), 280 mines. SUBMARINE DESTROYER SHIP, Sarpen, 187 tons, 9 knots, two 9-pr. and one 1-pr. Four sloops (1400 tons) and six minelayers, 500 tons, are projected, but no money has yet been voted.

\* Employed as training ship for Cadets.

†† 1500 H.P. Diesels, 4500 H.P. turbines. Max. speed on Diesels, 14 knots.

## SOVIET UNION.—Battleships.

NAME.	Displacement. tons.	Normal Length. ft.	Beam. ft.	Draught. ft.	Horse-Power. H.P.	Makers of Engines.	Where Built.	Cost.	Armour.				Armament.				Fuel. Coal. Oil.	Complement.		
									Belt.	Deck.	Side above Belt.	Bulkhead.	Gun Position. H. & S.Y. M.T.	Gun Position. Second M.T.	Gun Position. H. & S.Y. M.T.	Gun Position. In.	In.	In.	In.	
b. Paris Commune (ex-Sevastopol) †	23,000	594	87	274	42,000	{ Baltic Works }	Baltic Works	1911-1915	..	9-5	8	..	..	12-10	6	12 12-in., 16 4-7 in., 4 3-in. A.A., and smaller (sub.) 18-in.	4	23	2000 1000	1180
b. October Revolution (ex-Gangut)	22,600	5514	894	27	26,500	Nikolaev R.S.B.C.	..	1914-1917	..	12-4	3-11	9-8	..	12-8	5	12 12-in., 18 5-in., 4 9-5-in. A.A., 4-3-pr., 8 11-pr., 4 M. (sub.) 18-in.	4	21	2300 720	1252
b. Krasni Lenin. Grad (ex-Michael Franz, ex-Pol- tava)	22,600	5514	894	27	26,500	Nikolaev R.S.B.C.	..	1914-1917	..	12-4	3-11	9-8	..	12-8	5	12 12-in., 18 5-in., 4 9-5-in. A.A., 4-3-pr., 8 11-pr., 4 M. (sub.) 18-in.	4	21	2300 720	1252

\* Under French protection at Bizerta.

† 1 aircraft.

‡ These ships are being modernized; underwater protection and re-engining.



## SPAIN.

Class	NAME.	Displaced. (Extreme). Beam.	Drageept. Horse-Power. and Boiler. Type of Boilers.	Where Built.	Cost.	Armour.		Armament.		Fuel. Coal. Oil.	Speed. knots. Tubed Torpedo.	Complement.	
						Side. Deck.	Gun Position.	Guns.	Guns.				
b.	Jaime I. . . . .	11,224 tons. ft. 459 $\frac{1}{4}$	ft. 25 $\frac{1}{2}$	15,500 Ferrol . . . . .	1914 1921	£ ..	in. 8-5 in. (heavy) 3 (sec.)	10 8 12-in., 20 4-in., 4 3-pr., 4 3-pr. A.A., 2 M.	— 20 2 — 20	1850 tons. 20	854		
I. cr.	Canarias. . . . .	10,000 tons. P.T. Y.	17 490,000 Ferrol . . . . .	P.T.(G.) Y.	{ 1931 1934 1932 1930	£ ..	{ 4 3	{ 8 8-in., 6 4 7-in., 4 4 7-in. A.A. 8 2-pr. A.A., 2 seaplanes; 1 catapult.	12 1 { 21-in. (T.)	33 0 — 2750	700		
"	Baleares. . . . .	636	64	16 $\frac{1}{2}$ 80,000 Ferrol . . . . .	P.T.(G.) Y.	1928 1930	..	3	..	12 1 { 21-in. (T.)	33 0 — 1680	560	
"	Miguel de Cervantes	7475	54	16 $\frac{1}{2}$ 25,500 Ferrol . . . . .	P.T. Y.	1925 1927	..	—	..	12 1 { 21-in. (T.)	33 0 — 1200	404	
"	Almirante Cervera	579 $\frac{1}{2}$	50	15 $\frac{1}{2}$ 25,500 Ferrol . . . . .	P.T. Y.	1920 1923	..	3-1 $\frac{1}{2}$	3 9 6-in., 4 3-pr. A.A., 1 3-in., 4 M., 1 L.	25 5 21-in.	230		
"	Liberdad (ex-Príncipe Alfonso)	4857	462	14 $\frac{1}{2}$ 45,000 Ferrol . . . . .	P.T. Y.	1922 1924	..	3	.. 6 6-in., 4 3-pr. A.A., 4 M.	12 21-in. (T.)	500		
"	República (ex-Reina Victoria Eugenia)	4509	462	14 $\frac{1}{2}$ 45,000 Ferrol . . . . .	P.T. Y.	1923 1925	..	..	.. 4 4-in., 2 3-pr., 2 M	— 15 21-in. (T.)	— 15	131	
"	Mendoza Nuñez . . . . .	1335 (nor- mal)	33 $\frac{1}{2}$	1700 Ferrol . . . . .	P.T. Y.	1922 1924	..	..	.. 4 3-in., 2 M.	— 15 21-in. (T.)	— 15	131	
q.b.	Eduardo Dato . . . . .	800 (nor- mal)	213 $\frac{3}{4}$	1100 Cartagena . . . . .	P.T. Y.	1912 1912	..	..	..	— 15 21-in. (T.)	— 15	131	
"	Jose Canalejas . . . . .	11,385	418	55 23 3000 . . . . .	P.T. Y.	1911 1911	..	..	..	— 15 21-in. (T.)	— 15	131	
"	Antonio Canovas del Castillo . . . . .	9 $\frac{1}{2}$ (nor- mal)	30	9 $\frac{1}{2}$ 24 1-in., 4 3-in., A.A., 25 seaplanes . . . . .	P.T. Y.	1922 1923	..	..	..	— 14 0 21-in. (T.)	— 14 0	121	
"	Lauria . . . . .	11,385	418	55 23 3000 . . . . .	P.T. Y.	1922	..	..	..	— 14 0 21-in. (T.)	— 14 0	121	
"	Laya. . . . .	11,385	418	55 23 3000 . . . . .	P.T. Y.	1922	..	..	..	— 14 0 21-in. (T.)	— 14 0	121	
S.C.	Dédalo . . . . .	11,385	418	55 23 3000 . . . . .	P.T. Y.	1922	..	..	..	— 14 0 21-in. (T.)	— 14 0	121	

Motor-launches, M.1, 2, 4, 5, 6; H. 2, 3, 4, 40 tons. Sailing Training ships: Sebastian Elcano (1928), 3500 tons, 800 H.P. (Diesel), 9 5 knots; Galatea (ex-Clarastella) (1903), 2500 tons, bought in Italy. Nine armed trawlers (built in Britain). Eight fishery protection vessels. Three G.M.B.s. (ex-British). Submarine salvage vessel Kanguro (1917), 2750 tons, 10 knots, four 2-pr. Surveying ship Giralda (1894), 2400 tons, 20 knots, two 6-pr. guns. Tofino, 1200 tons, building at Ferrol.

These "coastguard patrol vessels" 260 tons, authorized; and three fishery protection vessels are projected. Their 1000 tons, are projected. The last estimates provide for the modernization of two others.

## SWEDEN.

Class.	Name.	Where Built.	Date of Completion.	Date of Launch.	Type of Power.	Horse-Power and Boiler-tube.	Length.	Beam.	Draught.	Armament.				Torpedo Tubes.	Speed.	Fuel, Coal, Oil.	Complement.				
										Cast.	Belt.	Deck.	Side above Belt.	Belt-deck.	Gun Position.	Guns.					
c.d.s.	Aran.	Y.t.	7000	Gothenburg	1901	1902	49 1/4 16·7	7000	16·7	2	7	18	..	..	7 1/2	5	2 8·3-in., 6 5·9-in., 10 6-pr., 1 I-pr.	2 17·2 sub. 18-in.	300	287	
"	Drottning-Victoria	(F.)	22,000	Gothenburg	1917	1921	396·7	61	21 1/2 (1.)	8·6	1 1/2	4	H.S.	..	8	5	4 11-in., 8 5·9-in., 6 3-in., 2 6-pr., 2 M.	2 23·0 sub. 18-in.	690	450	
a.c.	Fylgia	Y.t.	12,444	Stockholm	1905	1907	378	48·6 20·6 12·0	700	4	2	..	..	5	5	8 5·9-in., 10 6-pr., 2 1-pr.	2 22·7 sub. 18-in.	900	328		
Hanger Cruiser	Gotland	(G.)	38,000	Gothenburg	1931	1934	457·4	50·6 14·7 38·0	910,000 (estimated)	..	..	..	..	..	..	6-in., 4 8-in. A.A., 4 M., 100 mines, 8 aeroplanes, 1 catapult	6 27·0 21-in.	—	oil	453	
c.d.s.	Gustav V.	(G.)	22,000	Malmö	1918	1922	689·9	61	21 1/2	8·6	1 1/2	4	H.S.	..	8	5	4 11-in., 8 5·9-in., 4 3-in. A.A., 2 6-pr., 2 M.	2 23·0 18-in.	690	450	
"	Manligheten	Y.	7400	Malmö	1903	1904	49 1/4 17·4	50·5	18	3000	7	18	..	..	7 1/2	5	2 8·3-in., 6 5·9-in., 8 6-pr., 1 I-pr.	2 17·0 sub. 18-in.	690	450	
"	Oscar II	Y.	9000	Gothenburg	1905	1907	4085·313·6	50·5	18	20,000	6	2	6	6	7 1/2	5	2 8·3-in., 8 5·9-in., 8 6-pr., 1 I-pr.	2 18·0 sub. 18-in.	—	—	287
"	Sverige	Y.	6899	Gothenburg	1915	1917	392·7	61	21 1/2	8·6	1 1/2	4	K.S.	..	8	5	4 11-in., 8 5·9-in., 6 3-in., 2 6-pr., 2 M.	2 22·5 18-in.	—	—	330
"	Tapperheten	Y.	6000	Malmö	1901	1903	3361·287	49 1/4 17·7	6000	..	7	18	..	..	7 1/2	5	2 8·3-in., 6 5·9-in., 10 6-pr., 1 I-pr.	2 16·5 sub. 21-in.	690	450	
"	Wasa	Y.	6500	Stockholm	1901	1902	3361·287	49 1/4 17	6500	..	7	18	..	..	7 1/2	5	2 8·3-in., 6 5·9-in., 10 6-pr., 1 I-pr.	2 17·2 sub. 21-in.	690	450	

Gustav V. and Sverige have been reconstructed and modernised (1929-33). Drottning-Victoria is also to be reconstructed. Two older coast-defence ships, Odén, Thor (1897, 1899) (reconstructed 1915-16), 3287 tons, 16·7 knots, 5500 H.P. 2 10-in., 6 4·7-in., 8 6-pr. guns, to be used as depot ship for flying-boats. Minelayer Class Fleming, \* 1800 tons, 4 4·7-in., 20 knots, 100 mines; Vedette boats (employed as minesweepers), Skäret, Sveraren, Språgeren (1918), and 12 others, to be fitted as mine-sweepers. Jagaren, Kaparen, Snapphanen and Väkturen, 250 tons, 177 ft. long, 27 knots, 2 3-in. Torpedo gunboats, Jacob Bagge, Olofsson, Pållander, 758 tons, 2 4·7-in., 1 torpedo tube (15-in.), 20 knots. Gunboat Svenskland (1891), 354 tons. Depot ship for submarines, Sven (1886), 3300 tons, 4 4·7 in. Aircraft depot ship Dristigheten (1901), 3620 tons. Depot Ships :—Njord (1898), 3297 tons ; Göta, 3250 tons. Sailing training ships : Af. Chapman, Najaden, Jarramas und Falken (1877-1900).

\* Reported to be having Diesels fitted.

**UNITED STATES.—Battleships.**

Class.	Name.	Date for Schaffing and Replacing Under Washington Treaty (1923).*	Standard Displacement. (Extreme).	Length. (Extreme).	Beam.	Draught.	Type of Boiler(s), and Boiler(s).	Type of Machinery.	Where Built.	Cost. \$	Date of Launching.	Date of Delivery.	Armour.						Armament.			Speed. Knots.	Fuel. Coal. Oil.	Complement.
													Side Deck.	Belt.	Deck. Side above Belt.	Gun Position. Heavy Guns.	Gun Position. Secondary Guns.	Gun Position. Bulldog Guns.	Torpedo Tubes.	Guns.				
b.	<b>Arizona</b> † 1937	.32,600 608 106‡	274	33,376	New York (Navy Yard)	1915 1916 1,485,000	14-8 K.S.	3	..	..	..	..	18 K.S.	..	12 14-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 4 3-pr., 2 1-pr., 2 M., 2 L., 2 catapults, 8 floatplanes	..	..	..	..	21.0	— 2322	1400		
b.	<b>Arkansas</b> *	.26,100 562 106	26	30,000	New York (S.B. Co.)	1911 1912 964,000	11-5 K.S.	3	..	..	..	..	11 K.S.	..	12 12-in. (50 cal.), 16 5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 4 3-pr., 2 1-pr., 2 M., 1 catapult, 3 floatplanes	..	..	..	..	20.5	— 5100	1480		
b.	<b>California</b> 1941	.32,600 624 97‡	30‡	28,500	Mare Island (Navy Yard)	1919 1921 2,620,000	14-8 K.S.	3	..	..	..	..	18 K.S.	..	12 14-in. (50 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 4 (sub.) 6-pr., 2 M., 2 1-pr., 2 catapults, 21-in. 3 floatplanes	..	..	..	..	21	— 4658	1412		
b.	<b>Colorado</b> . 1942	.32,500 624 97‡	30‡	27,300	New York (S.B. Co.)	1921 1923 1,388,000	13½-12 K.S.	..	..	..	..	..	18 K.S.	..	8 16-in. (45 cal.), 12 5-in. (51 cal.), 8 5-in. (25 cal.) A.A., 4 (sub.) 6-pr., 2 1-pr., 2 M., 2 catapults, 21-in. 3 floatplanes	..	..	..	..	21.0	— 4570	1407		

b.	<b>Idaho</b> † . 1939 (Particulars prior to modernisation)	.30,800	624	973	29	32,000	New York (S.B. Co.)	1917	1919	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 14-in. (50 cal.), 12.5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 4 8-pr. (emb.) 2 1-pr., 2 M., 2 L, 2 catapults, 3 floatplanes	21	— 1374 3271
b.	<b>Maryland</b> 1941	.31,500	624	973	293	27,300	Newport News B.&W. tur. (G.) and electric drive	1920	1921	1,383,000	13 1/2 K.S.	..	..	..	18 K.S.	..	8 16-in. (45 cal.), 12.5-in. (51 cal.), 8 5-in. (50 cal.) A.A., 4 6-pr. (emb.) 2 1-pr., 2 M., 2 catapults, 3 floatplanes	21	— 1410 4570
b.	<b>Mississippi</b> † . 1938 (Particulars prior to modernisation)	.30,100	624	973	283	32,000	Newport News B.&W. C.T. (G.)	1917	1917	1,485,000	14 K.S.	3	..	..	18 K.S.	..	12 14-in. (50 cal.), 12.5-in. (51 cal.), 8 3-in. (50 cal.) A.A., 4 6-pr. (emb.) 2 1-pr., 2 M., 2 catapults, 3 floatplanes	21	— 1374 3271

\* See note \* on p. 261.

† See note † on p. 261.

\*\* See note \*\* on p. 261.

† The particulars given above are prior to modernisation. (See †, p. 261.)

|| Will be increased by about 3000 tons after modernisation.  
The sums given in this column are exclusive of the cost of armour and armament according to the system of making appropriations in the estimates.

## UNITED STATES.—Battleships—continued.

NAME.	DATE FOR SCRAPPING AND REPLACEMENT UNDER WASHINGTON TREATY. *	Cost.	Where Built.	Date of Launch.	Completion.	Armament.						Fuel. Coal/ Oil.	Speed. knots.	Torpedoes.	Complement.			
						Belt.	Deck.	Side above Belt.	Gun Position.	Guns.	Guns.							
b. Nevada \$.	1936 *	29,000	583	108	27½	25,000	Quincy, Mass. (Fore River)	1914	1916	1,211,342	13½-8 K.S.	..	13½-18-16 K.S.	..	10 14-in. (45 cal.), 12½-in. (51 cal.) 8 5-in. (25 cal.) A.A., 4 6-pr., 2 1-pr., 2 M., 2 L., 2 catapults, 3 floatplanes	—	20·5	— 1320 2000
b. New Mexico †	1939 (Particulars prior to modernisation)	30,000	624	97½	28½	28,500	New York (Navy Yard)	1917	1918	1,485,000	14 K.S.	3	..	18 K.S.	12 14-in. (50 cal.), 12½-in. (51 cal.), 8 3-in. (50 cal.) A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapults, 3 floatplanes	—	21·0	— 1414 3271
b. New York *	1935 *	27,000	573	106	26	28,100	New York (Navy Yard) recip.	1912	1914	1,315,114	12-4 K.S.	3	9 K.S.	10 K.S.	10 14-in. (45 cal.), 16½-in. (51 cal.), 8 3-in. (50 cal.) A.A., 4 6-pr., 2 1-pr., 2 M., 1 catapult, 3 floatplanes	—	21·0	— 1450 5200
b. Oklahoma §	1936 *	29,000	583	10½	28½	25,300	New York (S.B. Co.) recip.	1914	1916	2,200,000	13½-8 K.S.	..	13½-18-16 K.S.	..	10 14-in. (45 cal.), 12½-in. (51 cal.), 8 5-in. (25 cal.) A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapults, 3 floatplanes	—	20·5	— 1320 2000
b. Pennsylvania †	1937	33,100	608	10½	28	33,376	Newport B. & W. Cur. tur.	1915	1916	1,485,000	14 K.S.	3	..	18 K.S.	12 14-in. (45 cal.), 12½-in. (51 cal.), 8 5-in. (25 cal.) A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapults, 3 floatplanes	—	21·0	— 1380 2300
Tennessee .	1940	32,300	624	97½	30½	26,800	New York (Navy yard)	1919	1920	2,620,000	14-8 K.S.	3	..	18 K.S.	12 14-in. (50 cal.), 12½-in. (51 cal.), 8 5-in. (25 cal.) A.A., 4 6-pr., 2 1-pr., 2 M., 2 catapults, 3 floatplanes	—	21·0	— 1412 4656

b.	Texas*	. 27,000	573	106	26	28,100	Newport News	1912	1914	1,166,000	12-4 K.s.	3	9 K.s.	10 K.s.	14-8 K.s.	6 K.s.	10 14-in. (45 cal.)	16 8-pr., 2 1-pr., 2 3 floatplanes	5-in. (50 cal.)	A.A., 4 A.A., 4 catapult, 3 floatplanes	— 21-0 — 5200	— 1450 — 6200
b.	West Virginia	. 31,800	624	974	30	27,300	Newport News	1921	1923	1,383,000	13-1 K.s.	..	..	..	18 K.s.	..	8 cal.), 8 cal.), 8 cal.), 8 cal.), 8 cal.)	12 5-in. (25 cal.)	A.A., 4 A.A., 4 catapults, 3 floatplanes	— 21-0 — 4570	— 1407 — 4570	

Battleship Utah was converted to a mobile target ship in 1931 in accordance with the London Naval Treaty, and the battleship Wyoming was converted to a training ship (speed 18 knots) in 1931 in accordance with London Naval Treaty.

\* Modernised in 1927. Modernisation included fitting of bulge protection, protection of decks against serial attack, conversion to oil burning, installation of 3-in. A.A. battery, and addition of catapults. Cost about £600,000 each ship. Displacement increased about 3000 tons.

† Modernised in 1931. Modernisation included fitting bulges, reboiling, increasing elevation of turret guns, replacing former anti-aircraft batteries by 5-inch A.A. guns, new masts and new fire control.

‡ Taken in hand for modernisation 1931. New Mexico and Mississippi completed 1933. Idaho to complete 1934. Modernisation includes fitting increased deck protection, increasing elevation of turret guns, installation of eight 5-in. A.A. guns, reboiling, fitting of new turbines (the electric drive in New Mexico has been replaced by turbine machinery), alterations to masts and bridges, and fitting of bulges. The alterations will add about 3000 tons to the displacement.

§ Modernisation in 1929. Alterations include fitting of bulges, deck protection, tripod masts, increasing elevation of turret guns, fitting a new 5-in. anti-aircraft battery.

The modernisation of California, West Virginia, Colorado, Maryland, and Tennessee is projected.

\* The London Naval Treaty (1930) suspended replacement of capital ships between the years 1931-36 inclusive.

## UNITED STATES.—Aircraft Carriers.

Class.	NAME.	Displacement. (tons.)	Dimensions. (Extreme). Length, Breadth, Beam.	Drawgth. Standard.	Type of Machinery and Boiler(s).	Where Built.	Date of Launching.	Completion. Date of Launching.	Armour.		Armament.		Torped. Tubes.	Speed. knots.	Fuel. Coal, Oil.	Complement.
									Cost.	Deck. Portholes.	Guns.	Deck. Portholes.				
A.C.	Yorktown	20,000 (on W.L.)	762 83	214	120,000	Newport News	..	Bldg. est. 1936	..	..	..	5-in. A.A. guns.	..	..	..	..
A.C.	Enterprise	13,800 (on W.L.)	727 80	19	53,500 (G.)	Newport News	1933	1934 about*	£1,000,000	..	..	8 5-in. A.A., 76 aircraft	..	..	294	Oil
A.C.	Ranger CV4	..	..	..	..	S. B. Co.	1925	1927	9,000,000	..	..	8 8-in. (55 cal.)	..	..	334	1434
A.C.	Lexington	33,000 (on W.L.)	880	104	314	Bethlehem S. B. Co. turb.electric	1925	1927	9,000,000	..	..	12 5-in. (25 cal.)	A.A.	..	..	1670 ex Air
A.C.	Saratoga	..	..	..	..	(Fore River) N.Y. Ship building Co.	1925	1927	9,000,000	..	..	4 6-pr.	Operates about 80 land- planes.	..	..	7100
A.C.	Langley †	11,500	542	654	19	180,000 72,000 72,000 turb.electric	1912	1922 as Navy Yard	..	..	..	6-in. (51 cal.)	operates 32 land- planes, 2 catapults. aircraft carrier	—	15	411
														—	2000	

For particulars of Aircraft Tenders and Repair Ships, see page 264.

\* The estimated cost has been increased from 19 million dollars to 21 million dollars to allow for the conversion of the vessel from a "flush-deck" type of carrier to an "island" type of carrier during construction.

† Formerly Collier Jupiter, converted 1921 at Norfolk Navy Yard.

## UNITED STATES.—Cruisers.

Class.	NAME.	Armament.				Fuel.	Coal. Oil.	Complement.						
		Beam.	Draught.	Where Built.	Guns.	Speed.	Torpedoes.							
Brooklyn Class	Savannah Nashville Brooklyn Philadelphia	10,000 600 (onw.l.)	61 $\frac{1}{2}$	19 $\frac{3}{4}$	95,000	N.Y.S. Co., Camden N.Y.S. Co., New York Navy Yard Philadelphia Navy Yard	estd. end of 1936	2,410,000 estimated	Belt. Deck. Post-tension Gun	in.	in.	32	..	..
Quincy Class	Vincennes Quincy	10,000 estimated	575	61 $\frac{3}{4}$	19 $\frac{1}{2}$	107,900	Bethlehem S. B. Corp., Quincy New York, S. B. Co., Mare Island Navy Yard New York (G.)	..	1.5 6-in.	..	..	..	..	..
Astoria Class	Tuscaloosa San Francisco New Orleans Astoria	10,000 (overall) 573 (onw.l.)	61 $\frac{3}{4}$	19 $\frac{1}{2}$	107,000 (G.)	107,000 (G.)	New York, Navy Yard Puget Sound Navy Yard Philadelphia Navy Yard Bethlehem S. B. Co., Quincy New York S. B. Co.	1933 1934	2,460,000 2,460,000 2,460,000 2,460,000	9 8-in. (55 cal.), 8 5-in. (25 cal.) A.A., and 10 smaller, 2 catapults, 4-6 aircraft, 50 mines	—	32 $\frac{1}{2}$	oil	602
Portland Class	Minneapolis Portland Indianapolis Northampton	9800 9950	584 (onw.l.)	65	17 $\frac{1}{2}$	107,900 (G.)	9800 9950 107,900 (G.)	1932 1931 1932 1929	2,210,000 2,250,000 2,180,000 American Brown Boveri Elec. Corp. Puget Sound Navy Yard Mare Island Navy Yard Newport News S. B. & D. D. Co., 1930	9 8-in. (55 cal.), 8 5-in. (25 cal.) A.A., and 10 smaller, 2 catapults, 4-6 aircraft	6 21-in. (T)	32 $\frac{1}{2}$	oil	602
Chester Class	Chester Louisville Chicago Houston Augusta Clas <sup>3</sup>	9200 9050 9300 9050 9050	65 66 68 65 66	16 $\cdot$ 3- 17 $\cdot$ 6	107,000 P.T. (G.)	107,000 P.T. (G.)	9200,000 Navy Yard Mare Island Navy Yard Newport News S. B. & D. D. Co., 1930 1931 1931 1929 1930 1931	2,230,000 2,290,000 2,280,000 2,170,000 2,170,000	9 8-in. (55 cal.), 4 5-in. (25 cal.) A.A., 2 3-pn., 2 catapults, 4-6 sea- planes	6 21-in. (T)	32 $\frac{1}{2}$	oil	611	

Omaha Class	Cincinnati	7050	555½	55½	13½	90,000	Tacoma, Wash.	1921	1924	1,730,000	3	..	12 6-in. (53 cal.) (Cincinnati), 6-in. and Detroit, 10 6-in., 6	33·7	—
	Concord	7050	555½	55½	13½	90,000	Philadelphia (Cramp)	1921	1924	1,742,000	—	..	4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 air-craft	450	450
Omaha Class	Detroit	7050	555½	55½	13½	90,000	Bethlehem S. B. Co. (Cramp)	1922	1923	1,584,000	3	..	12 6-in. (53 cal.) (Marble-head, 11 6-in.), 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
	Trenton	7050	555½	55½	13½	90,000	Philadelphia (Cramp)	1923	1924	1,823,000	—	..	12 6-in. (53 cal.) (Marble-head, 11 6-in.), 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	450	450
Omaha Class	Marblehead	7050	555½	55½	13½	90,000	Philadelphia (Cramp)	1924	1924	1,810,000	3	..	10 6-in. (53 cal.) (Omaha), 12 6-in., 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
	Memphis	7050	555½	55½	13½	90,000	Philadelphia (Cramp)	1924	1925	1,838,000	—	..	10 6-in. (53 cal.) (Omaha), 12 6-in., 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
Omaha Class	Milwaukee	7050	555½	55½	13½	90,000	Tacoma, Wash.	1921	1923	1,794,000	—	..	10 6-in. (53 cal.) (Omaha), 12 6-in., 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
	Omaha	7050	555½	55½	13½	90,000	Tacoma, Wash.	1920	1923	1,823,000	3	..	10 6-in. (53 cal.) (Omaha), 12 6-in., 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
Omaha Class	Raleigh	7050	555½	55½	13½	90,000	Bethlehem S. B. Co., Quincy (Cramp)	1923	1924	1,616,000	—	..	10 6-in. (53 cal.) (Omaha), 12 6-in., 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
	Richmond	7050	555½	55½	13½	90,000	Philadelphia (Cramp)	1921	1923	1,742,000	—	..	10 6-in. (53 cal.) (Omaha), 12 6-in., 4 3-in. (50 cal.) A.A., 2 21-in. 3-pr., 2 catapults, 2 floatplanes	33·7	—
Pensacola Class	Salt Lake City	9100	585½	64	16	107,000	New York S. B. Co.	1929	1929	3,400,000	—	..	10 8-in. (55 cal.) (4 5-in. (25 cal.) A.A., 2 3-pr., 2 catapults, 4 planes	32½	—
	Pensacola.	9100	585½	64	16	107,000	Navy Yard, New York	1929	1930	3,400,000	—	..	10 8-in. (55 cal.) (4 5-in. (25 cal.) A.A., 2 3-pr., 2 catapults, 4 planes	32½	—

The 1923-4 building programme includes 1 heavy cruiser, 10,000 tons (8-in. guns) to be built at Philadelphia Navy Yard (authorised by Act of Congress in 1929). Under the terms of the London Naval Treaty her keel will not be laid until January 1, 1935. This will be the last of the 18 cruisers of this type allowed U.S.A. under the Treaty. Three light cruisers of 10,000 tons (6-in. guns), one at Newport News S. & D. D. Co. (estimate £2,320,000), the Boise; one at N.Y. Shipbuilding Corp., Camden (estimated cost £2,395,000), the Phoenix; and one at the New York Navy Yard, the Honolulu.

**OLD CRUISER.**—Rochester (1893), 7350 tons, 4 8-in., 8 5-in., 2 3-in., 2 3-pr., 2 3-pdr., 3 1-pr.; Sacramento (1914), 1140 tons, 12 4-in., 2 3-pr., 2 1-pr.; Tulsa (1922), and Asheville (1920), 1270 tons, 12 knots, 3 4-in., 2 3-pr., 2 3-pdr., 3 1-pr.; Listed for disposal.

**GUNBOATS.**—Tulsa (1922), and Asheville (1920), building at Charleston Navy Yard, and Erie, building at New York Navy Yard, 2000 tons. River Gunboats.—Guam (1927), Tutuila (1928), 370 tons, 14 knots, 2 3-in., 8 m.; Palos, Monocacy (1914), 180 tons, 13½ knots, 2 3-in.; Panay, Oahu (1928), 450 tons, 15 knots, 2 3-in., 2 3-pr., 2 3-pdr., 3 1-pr.

**MINELAYERS.**—Yosemite ex-San Francisco (1890), 3700 tons, 19½ knots, 4 5-in., 4 6-pr., 2 3-in., A.A., 300 mines; 12 light mine-layers, ex-T.B.D.'s, mounting 4·4-inch guns. Minelayers.—Bird class (1918, 1919), 840 tons, 1400 H.P., 14 knots, 2 3-in., A.A., 350 mines; 12 light mine-layers, ex-T.B.D.'s, mounting 4·4-inch guns. Minelayers.—Chewink, Falcon, Mallard, Ortola, Pigeon and Widgeon, built 1914-18, 1210-1270 tons, 14 knots).

**AIRCRAFT TENDERS.**—Patoka (1919), 16,800 tons, 10·9 knots, 2·5-in.; Heron (minesweeper) (1918), 950 tons, 14 knots, 2 3-in., A.A.; Jason (1913), 19,250 tons, 14·3 knots, 4·4-in., 27 planes. Arostook (1918) (minelayer), 4950 tons, 20 knots, 1·5-in., 2 3-in. (can carry 350 mines); Argonne (1921), 9005 tons, 15 knots, 4·5-in.

**AIRCRAFT REPAIR SHIP.**—Wright, 953 tons, 15 knots, 6000 H.P., 2 5-in., 2 3-in., A.A., 20 planes. Destroyer Tenders.—Dobbin (12,450 tons), Whitby (12,450 tons), and Mervilla (17,150 tons), 16 knots, 8 5-in., 4 3-in.; Alter, Denebola and Rigel, 7,600 tons, 10½ knots, 4·5-in., 4 3-in. A.A.; Black Hawk, 8900 tons, 13 knots, 4·5-in.; Brigadier, 11,750 tons, 12½ knots, 8 5-in.

**SUBMARINE TENDERS.**—Holland (1926), 11,570 tons, 16 knots, 8 5-in., 4 3-in. A.A., 2 6-pr.; Bushnell (1915), 2886 tons, 14 knots, 4 5-in.; 13 knots, 2 5-in.; Camden (1900), 7356 tons, 12 knots, 4 4-in.; Beaver (1910), 5320 tons, 16½ knots, 4 5-in.

**REPAIR SHIPS.**—Medusa (1924), 8089 tons, 16 knots, 4·5-in., 2 3-in., A.A., 2 6-pr., Vestal, Prometheus (1909), 6378 tons, 16 knots, 4·5-in., 1·3-in. 25 submarine chasers (80 tons), mounting 1·3-in. gun.

5 Store ships, 6 Cargo ships, 3 Transports, 3 Hospital ships, 25 Patrol vessels (Eagle class, 430 tons, 18 knots, 2 4-in., 1 3-in. A.A.), Craneship; Kearsgate (capacity 250 tons), 2 ammunition ships, and other auxiliaries.

## SHIPS OF THE LESSER NAVIES.

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**Albania.**—Two gunboats (ex-German), 230 tons, 4 motor launches (built in Italy, 1928), 40 tons, 14 knots.

**Austria.**—Patrol vessels: Neretva, Compo (1915), 130 tons, 16 knots; Fogas (1915), 62 tons, 16 knots, and Pozsony (1915), 130 tons, 16 knots. Disarmed and are unserviceable.

**Bulgaria.**—Under the terms of the naval clauses of the Peace Treaty, Bulgarian warships of all classes, existing or under construction, were surrendered to the Allied and Associated Powers or broken up. All vessels are under the Ministry of Commerce for police and preventive duties; six torpedo boats (100 tons, 28 knots), two minesweepers (ex French), and six motor boats of little value.

**China.**—Cruisers: Ning Hai (Kobe, 1932) and Ping Hai (Shanghai, building), 1990 tons, 360 ft. length, 10,500 H.P., 24 knots, six 5·5-in. and six 3·1-in. guns, four 21-in. torpedo tubes; 2 aircraft; Chao Ho (Elswick, 1912, 2600 tons), Ying Jui (Barrow, 1912, 2460 tons, 20 knots)—two 6-in., four 4-in., two 3-in., six 3-pr., two 1-pr., two 18-in. torpedo tubes; Hai Yung, Hai Chou, and Hai Chen (Germany, 1897–1898, 2950 tons, 19½ knots)—three 5·9-in., eight 4-in. and smaller, one submerged torpedo tube; Hai Chi (Armstrong's, 1899, 4300 tons, 24 knots)—two 8-in., ten 4·7 in., twelve 3-pr., ten maxims, five torpedo tubes. Destroyers: Chien Kang, Hsiao An, and Yu Chang, of 390 tons, speed 32 knots, armament: two 3-in., four 3-pr., and two 18-in. T.T. Torpedo boats: Eight (62–90 tons). Gunboats: Yat Sen (1931), 1650 tons, 20 knots, two 6-in., four 3-in., Kianing, Haining (1933), 300 tons, and fourteen others. Funing, Suining (300 tons, 12 knots, two 3-in. guns), and several others building at Shanghai. River gunboats: Forty-two. Also several dispatch vessels and torpedo gunboats. There are, in addition, a few gunboats and miscellaneous vessels belonging to the water-police of the Kwang Tung Province. One seaplane carrier, Teuck Sheng, building. 2 cruisers, 4 destroyers, and 4 submarines are included in the new construction programme.

**Colombia.**—Gunboats: Presidente Mosquera, 200 tons; Cartagena, Santa Marta, Barranquilla (Yarrows, 1930), length 137½ feet, speed 18½ knots, one 3-in. gun. The following two destroyers were purchased from Portugal early in 1934, Caldas and Antioquia

(1934), 1282 tons, length 319 ft., beam 31 ft., speed 36 knots, four 4·7 in. guns, one 1½-in. A.A., and eight 21-in. torpedo tubes; built by Yarrow's in Portugal. River gunboats: General Nerino and Esperanza, 400 tons, 15 knots. Motor boats: Cauca (1913), 50 tons, four Guardacostas (Yarrow, 1913), 20 tons. Patrol vessels: Boyaca and Pechincha. Six revenue cutters building at Thornycroft's.

**Cuba.**—Light cruiser, Cuba, 2055 tons, 6000 H.P. 18 knots, two 4-in., six 6-pr., two 3-pr., four 1-pr., 2 m. Training ship: Patria (1911), 1200 tons, 16 knots, two 3-in., four 3-pr. Gunboats: Habana, Pinar del Rio, Villas, Matanzas (1912), 80 tons, 12 knots, one 1-pr.; 24 de Febrero, 10 de Octubre (1911), 218 tons, 12 knots, three 3-pr.; Baire (1906), 500 tons, 14 knots, four 3-in., two 3-pr., 1 m.; Yara (1895), 450 tons, 12 knots, two 6-pr.; 20 de Mayo (1895), 200 tons, 12 knots, two 3-pr., two 1-pr.; Enrique Villuendas (1899), 178 tons, 16 knots, two 3-pr.: Captain Quevedo (1932), 187 tons, 12 knots, two 1-pr., one 3-in. A.A., and General Zagaz, 500 tons, two 1-pr. One patrol boat building at Havana, 115 tons, 3 guns.

**Czecho-Slovakia.**—There are two river gunboats carrying two 3-in. guns for training purposes and four small minelayers.

**Ecuador.**—The torpedo cruiser Libertador Bolivar (1896), disarmed and of no fighting value, mine-laying patrol vessels Tarqui and Enrique Valdez (50 tons), and gunboat Cotopaxi (1884), 700 tons.

**Estonia.**—Mine-layers Kalev and Olev, minesweepers Sourop and Ristna, two ice-breakers, and Peipus Lake gunboats Ahti and Tartu. Torpedo boat Sulev (*ex-German A 32*) (1917), 243 tons, 26 knots, two 3-in., 2 torpedo tubes; gunboat Laene, river gunboat Mardus. £500,000 voted for new construction of four torpedo boat destroyers and two submarines. Six C.M.B.'s are contemplated.

**Finland.**—Patrol boats Klas Horn (1892) (*ex-Posadnik*), Uusimaa (1919), Hämeenmaa (1918), Matti Kurki (1892) (*ex-Voevoda*), Karjala (1918) (*ex-Filin*), and Turunmaa (1918) (*ex-Orlan*): 7 C.M.B.'s; 6 ice-breakers, a minelayer (150 mines), 640 tons, and three mine-sweepers, and 21 motor launches. Two armoured gun-boats (4-in. belt), Väinämöinen and Ilmarinen, length 305 feet, 4000 tons, 4000 H.P. (Diesel-electric), 15 knots, four 10-in. guns, eight 4·7-in. guns, built at A/B Maskin and Brobyggnads, Abo (1932-3). Submarines Iku-Turso, Vetehtinen and Vesihiihi (Abo, 1930), 450 tons, speed 15 knots surface, 9 knots submerged, one 3-in. gun; Saukko (Helsingfors, 1930), 99 tons, two torpedo tubes. Sailing training-ship Suomen Joutsen (*ex-German Oldenburg*) An ice-breaker and submarine dépôt ship is projected.

**Haiti.**—Special service vessels, Nord Alexis (1891), 1230 tons, two 4·7-in.; Veretieres (1889), 270 tons; 17 Decembre, 851 tons; Pacifique, 488 tons.

**Hungary.**—Patrol vessels: Sopron, Debreczen, 138 tons, two 3-in., 4 m.; Kecskemet, Szeged and Györ, 131 tons, four 3-in., 4 m.; Birago, 59 tons, one 3-in., 4 m.; also 12 motor launches.

**Latvia.**—Gunboat Virsaitis (*ex-German M68*), 480 tons, two 3-in., two 6-pr., one 3-in. A.A., one torpedo tube; 1 ice-breaker, Krisjanis Valdemars; 2 submarines (1927), Ronis and Spidola,  $\frac{390}{514}$  tons surface displ.,  $\frac{14\frac{1}{2}}{9\frac{1}{4}}$  knots, one 3-in. A.A., 2 m., 6 torpedo tubes; 2 submerged mine-sweepers, Imanta, Viesturs, 225 tons, 14 knots, one 3-in., 4 m., 30 mines, completed in 1926; one submarine depot ship, Varonis, formerly an ice breaker; Surveying vessel, Hidrografs.

**Manchukuo.**—Gunboat Haifeng, 200 tons, 13 knots, and another similar. The following have been built recently by the Kawasaki Works at Harbin:—Tatung and Limin, 65 tons, 12 knots, 3 guns, Wenmin, Huimin, Pumin, Onmin, Keimin and Fumin, 15 tons, 10 knots, 3 machine guns. The following vessels were launched at the beginning of 1933 at Yokohama, Daichi Kaihen and Daini Kaihen, 15 knots, 8 machine guns, and the river gunboats Daido and Rinni, 56 tons, 13 knots, one 6-in. gun. Coastguard ships Kaiho, Kaisui, Katei, and Kaikwa, 45 tons.

**Mexico.**—Coast defence vessel Anahuac (1898), 3162 tons, 15 knots, two 9·4-in., four 4·7-in., four 6-pr., 2 m., 2 L.; gun-vessels, Tampico and Vera Cruz (Elizabeth Port, New Jersey, 1903); displacement, 980 tons; armament, two 4-in. Q.F., four 6-pr.; 16 knots; fitted to serve as transports for 200 troops, Bravo 1200 tons; 2,600 I.H.P.; 17 knots (Leghorn, 1904), and Aguas Prieta, 1200 tons; 1800 I.H.P.; 15 knots, two 4-in., two 6-pr. Two revenue cutters (*ex-U.S. submarine chasers*). Four patrol boats, 276 tons, one 6-pr., 9 knots. Eight coastguard vessels building in Spain.

**Paraguay.**—Gunboats: Humayta and Paraguay (1931), 636 tons, 17 knots, four 4·7-inch, four 3-inch A.A. guns, six mines; two older, Capitan Cabral and Tacuari. Two despatch vessels and two vedettes.

**Persia.**—Gunboats: Babr and Palang (Italy, 1932), 950 tons, 205 feet long, 1900 H.P. (Diesel), 15 knots, two 4-in. and two 3-in. A.A. guns. Four motor patrol boats built in Italy (1932). Semorg, Chahbaaz, Karkas and Sharock, 330 tons, 900 H.P. (Diesel), 15 knots, two 3-in. guns. Also several old small gunboats and motor dhows. Gunboats and patrol vessels are for customs work.

**Peru.**—Almirante Grau and Coronel Bolognesi, cruisers 3200 tons; (Barrow, 1906); two 6-in., eight 3-in., eight Maxim; 2 submerged torpedo tubes; 24 knots; converted to oil-burning 1925, to be fitted as minelayers; also Lima (1880, refitted 1920) (parent

ship for submarines), 1790 tons, 10 knots, four 4-in. Gunboat America, 200 tons, 14 knots. Destroyer, Rodriguez, 500 tons, 28 knots. T.B.D.s Lennuk (1917), 1400 tons, 35 knots, five 4-in. guns, one 2-pr., nine T.T., eighty mines, and Vambola (1918), 1260 tons, 35 knots, four 4-in. guns, two M., one 2-pr., nine T.T., eighty mines, have recently been purchased from Estonia, and have been renamed Almirante Guise and Almirante Willar respectively Submarines R1-4, built in U.S.A. (1926-9), and R5 and R6 authorised,  $\frac{576}{682}$  tons,

$\frac{14\frac{1}{2}}{10}$  knots, one 3-in., 4 torpedo tubes. One vedette boat, the Napo, 98 tons, built by Yarrow, 1921, three 1·8-in. Two destroyers are projected. Two river gunboats of 250 tons are building at New Jersey, for service on the Amazon.

**Poland.**—Five *ex-German* torpedo boats (855 tons, 20 knots, two 3-in., 18-in. torpedos) for police purposes. Gunboats Komendant Pilsudski and General Haller, 350 tons, 14 knots, built in Finland (1920). Training ship Iskra. Monitors Warszawa, Horodyszcze, Krakow, Wilno, Torun, Pinsk. Twenty motor boats. Two destroyers, Burza, Wicher, completed 1931-2 at Chantiers Navals Français, 1515 tons, 33,000 H.P., 33 knots, four 5·1-in., one 2·9-in. A.A., 6 torpedo tubes. Three submarine minelayers built in France, Rys, Zbik, and Wilk, completed 1931-2;  $\frac{964}{1230}$  tons,  $\frac{1800}{1200}$  H.P., 14 knots surface, 9 knots submerged; one 4-in., one 2-pr., 6 torpedo tubes, 40 mines. A minelayer is building in France, and four mine-sweeping trawlers in Poland. A submarine minelayer is projected.

**Portugal.**—The sloop Adamastor, 1760 tons, 18 knots (Leghorn, 1897, reconditioned 1925), two 4·7-in., four 4·1-in., 3 torpedo tubes (14-in.). The minelayer Vulcano (151 tons) (Thornycroft, 1909). Two sloops, about 1200 tons, sold out of the British Navy, Carvalho Araujo (*ex-Jonquil*) and Republica (*ex-Gladiolus*), two 4-in., two 3-in. A.A. Coast defence vessel Vasco da Gama (1876, reconstructed 1903), 3030 tons, 15·5 knots, two 8-in., one 6-in., one 8-in. Understood to be disarmed. Destroyers Tamega, Guadiana (1913-24), 700 tons, 11,000 H.P., 27 knots, one 4-in., two 3-in., two torpedo tubes. Submarines Foca, Golfinho, and Hidra (Laurenti); 260-389 tons, 13-8·5 knots, 2 T.T. Gunboats Damao and Zaire (1919), Diu and Lagos (1932), 400 tons, 700 H.P., 13 knots, two 3-in., two 3-pr., and there are 18 older ones.

*New Construction (1930 programme).*—1st class sloops: Alfonso de Albuquerque and Bartolomeu Diaz (building at Hawthorn Leslie, Newcastle), 1760 tons, 21 knots, four 4·7 in., two 3-in. A.A., four pom poms, two torpedo tubes, one catapult, and 40 mines. 2nd class sloops: Goncalo Velho and Goncalves Zarco (Hawthorn Leslie, Newcastle, 1933), 1045 tons, 16 knots, three 4·7-in., two pom poms. Pedro Nunes (building at Lisbon), 1080 tons, 17 knots, two

4·7-in., Destroyers: Vouga and Lima (Yarrow's, Scotstoun, 1933), and Dao (building by Yarrow's in Portugal), 1280 tons, 33,000 H.P., 36 knots, four 4·7-in., three 1·5-in. A.A., two quadruple 21-in. torpedo tubes. Submarines: Delfin, Espardate, and Golfinho (building at Vickers); surface condition, 776 tons, 2300 H.P. and 16½ knots; submerged condition, 1000 tons, 1000 H.P. and 9½ knots; one 4-in. gun, six 21-in. torpedo tubes.

Two destroyers, Douro and Tejo, sister vessels to Dao, were bought by the Colombian Government and renamed Antioquia and Caldas (see Colombia). Two identical torpedo boat destroyers have been ordered from the Society of Constructions and from Naval Repairs Co., Lisbon; engines, boilers and all material will be supplied by Yarrows.

Other ships, including an aircraft carrier (5000 tons), are projected. The contract for an aircraft carrier was placed in Italy in 1931, but has been cancelled.

**Rumania.**—*River Monitors.*—Bucovina (1916), 540 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Ardeal (1905), 440 tons, 10 knots, two 4·7-in., one 3-pr., one 3·5-in. A.A.; Basarabia (1915), 530 tons, 12 knots, two 4·7-in., two 3-pr., two 11-pr. A.A.; Lascăr Catargiu, Ioan Brătianu, Mihail Kogălniceanu, Alexandru Lahovari (1907–08), 670 tons, 13 knots, three 4·7-in., two 3-pr., one 3-in. A.A., 2 M.

*Flotilla Leaders.*—Regele Ferdinand and Regina Maria (Naples, 1930, Thornycroft's design), 1785 tons, 38 knots; length 334½ ft., five 4·7-in., three 2-pr. A.A.; two twin torpedo tubes. Marasti, Marasesti (*ex*-Italian Nibbio, Sparviero), 1917–18, 1460 tons, 35 knots, five 4·7-in., four 3-in. A.A., 2 M., 2 twin torpedo tubes, 50 mines.

Seven vedettes, 50 tons, 18 knots, one 3-pdr. gun.

*Gunboats.*—Stihi, Lepri Remus, Dumitrescu, Ghiculescu (1916–17, *ex*-French Magnonne, Friponne, Chiffonne, Impatiene), 350 tons, 15 knots, two 3·9-in., 2 M.

*Submarine.*—Delphin (Quarnaro, Fiume, 1932). Displacement, 640 tons surface, 817 tons submerged; speed 14 knots surface, 9·5 knots submerged, one 4·2-in. gun, 6 torpedo tubes.

There are also five armed motor boats, police craft (*ex*-Austrian T.B.s) Naluca, Sborul, and Zmeul, and seven armed launches.

A submarine dépôt ship, Constanta, 1821 tons, two 4-in. A.A. guns (Fiume 1930).

Training ship, Nircea, 350 tons, 8·5 knots, two 1-pr. Sailing with auxiliary engines.

**Siam.**—The gunboats Ratnakosindr (1925), 920 tons, two 6-in., four 3-in. H.A., 12 knots; Bali and Sugrib (1900), 580 tons, 11·5 knots, one 4·7-in., five 6-pr., 2 M.; Sukhodaya (Vickers, 1930), 1030 tons, 13 knots, two 6-in., four 3-in. A.A. Two 380-ton, 27-knot destroyers, built at Kobe, Sua Gamron Sindhu and Sua Tayanchor. Phra Ruan (*ex*-British Radiant, 1917), 719 tons, 35 knots, three

4-in. Four torpedo boats (1908-13), 90 tons, 22 knots, one 6-pr., one 3-pr. Five 55-ft. Thornycroft C.M.B.s. Two torpedo boats under construction at Kawasaki Works, Japan (400 tons). Training ship Chao Phra (1919), 840 tons, 16 knots.

**Turkey.**—The old battleship Torghud Reis (*ex-German Weissenburg*, 1891), refitted 1927, 9842 tons, 17 knots, six 11-in., three 8-in., two 2·5-in. A.A., 2 submerged torpedo tubes. The battle-cruiser Yavouz Sultan Selim (1912) (*ex-Goeben*), 22,784 tons, 27 knots. Armament: ten 11-in., ten 5·9-in., eight 3·5-in., four 1·5-in. P.P., 2 M., 1 L., 4 submerged torpedo tubes. Light cruisers: Hamidieh (Elswick, 1904), 3830 tons, speed 22 knots; armament: two 5·9-in., six 3-in., eight 3-in. A.A., two 18-in. torpedo tubes; Medjidieh (Philadelphia, 1903), refitted 1927, 3300 tons, speed 22 knots, armament: four 5·1-in., two 3-in. A.A., 4 M. Destroyers: Adatepe, Kocatepe (Ansaldo, Italy, 1932), 1310 tons, 48 knots, four 4·7-in., three 2-pr. A.A. guns, six 21-in. tubes. Tinaztepe and Zafer (Cantiere Navale del Tirreno, Italy, 1932), 1840 tons, 38 knots, four 4·7-in. guns, three 2-pr. A.A., six 21-in. tubes. Submarines Ikindji-in-Uni and Birindjiin-Uni (Fijenoord, Rotterdam, 1928),  $\frac{433}{556}$  tons,  $\frac{13\frac{3}{4}}{9\frac{3}{4}}$  knots, one 3-in., 1 M., six 18-in. torpedo tubes. Dumluipinar (minelayer), (Monfalcone, 1932), 950 tons, 15 knots, 2400 H.P. surface, 1200 tons,  $9\frac{1}{2}$  knots, 1400 H.P. submerged, one 4-in. A.A., 4 torpedo tubes, 40 mines. Sakarya (Montfalcone, 1932),  $\frac{985}{1220}$  tons, 15 knots 1500 H.P. surface, 925 tons, 9 knots, 1100 H.P. submerged, one 4-in., six 21-in. torpedo tubes. Reported that two 10,000-ton cruisers, two destroyers, and 4 submarines are to be built in Japan. Ten new submarines projected.

**Uruguay.**—Torpedo-gunboat (training ship) Uruguay (1910), 1400 tons; two 4·7-in., four 3-in.; two 18-in. torpedo tubes. Surveying ship Capitan Miranda (1930), 540 tons. Gunboat Rio Branco. Two 150 ton coastguard cutters projected. Training ship, 18 de Julio, 680 tons, 12 knots.

**Venezuela.**—Old gunboats Mariscal Sucre (1125 tons), two 4-in., two 6-pr. General Salom (750 tons). Miranda (200 tons), Brion (150 tons). Armed tug José Felix Ribas, two 6-pr. Armed yacht Maracay.

**Yugoslavia.**—Submarines Hrabri and Nebojsca, completed at Armstrong's 1928, displacement 870 tons surface, 1146 tons submerged; speed 15 knots surface, 10 knots submerged; mount two 4-in., six 21-in. torpedo tubes. Smeli and Osvetnik, completed at Nantes, 1929; displacement 570 tons surface, 797 tons submerged, speed 14·5 knots surface, 9·25 knots submerged, carry one 4-in., one 2-pr., and 6 torpedo tubes (21-in.). Two coastal motor boats, 38 knots, built at Thornycroft's, completed in 1927. Old cruiser Dalmacija (*ex-*

German Niobe), refitted 1926, 2600 tons, six 8-in., is used as a gunnery and general training ship. There are four *ex-Austrian* river monitors, Vardar, Drava, Sava, Morava, 400–530 tons, mounting two 4·7-in. and smaller guns; eight *ex-Austrian* T.B.'s; two patrol boats; six mine-layers (*ex-German*, 1918), 380–512 tons, 15 knots, two 8·9-in., 40 mines; six mine-sweepers; one seaplane dépôt ship, Zmaj (built at Hamburg, 1929), 1870 tons; one training ship; two submarine dépôt ships (1895), and auxiliary craft.

One flotilla leader, Dubrovnik, built at Yarrow's, Scotstoun, completed 1932, length 371 feet, displacement 1880 tons, 42,000 S.H.P., speed 37 knots, carries four 5·5-in., 2 twin 2-pr., 2 triple 21-in. torpedo tubes, and 40 mines.

Two flotilla leaders and six torpedo boats are projected.

## BRITISH AND FOREIGN FLOTILLAS.

## Great Britain.

Name or Number.	Built by.	Completed.	Dimensions.				Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity, Oil.						
			Length (Extreme).	Beam.	Draught.	Number of Screws.												
FLOTILLA LEADERS.																		
Grenville .....	Yarrow .....	Bldg.	ft. ins.	ft. ins.	ft. ins.	Tons.		Knots.				Tons.						
Faulknor .....	Yarrow .....	Bldg.	..	..	..	..	..	..	5 4'-7-in.	2 Q.	..	..						
Exmouth .....	Portsmouth Dockyard	1934	343	33 9	8 8	2	1475	38,000	36	2 6-in. M. 5 smaller.	21"	..						
Duncan .....	Portsmouth Dockyard	1933	329	33 0	8 8	2	1400	36,000	35½	4 4'-7-in.	2 Q.	..						
Kempenfelt .....	J. S. White .....	1932	329	33 0	8 7	2	1390	36,000	35½	2 2-pr. 1 M., 4 L.	2 Q.	..						
Keith .....	Vickers .....	1931	323	32 3	8 6	2	1400	34,000	35	4 4'-7-in. 1 M., 4 L.	2 Q.	..						
Codrington .....	Swan Hunter .....	1930	343	33 9	10 0	2	1540	39,000	36	5 4'-7-in. 2 2-pr. 2 Q.	21"	..						
Abdiel .....	Cammell Laird .....	1916	325	31 9	11 3	3	1310	36,000	34	3 4-in. 1 2-pr. 1 M., 4 L.	—	130						
Shakespeare .....	Thornycroft .....	1917							5 4'-7-in.	1 3-in. A.A. 2 2-pr. A.A.	2 T.	515						
Spenser .....	1917								1 3-in. A.A.	2 2-pr. A.A.	21"	182						
Wallace .....	1919								1 M., 4 L.	1 M., 4 L.		500						
Keppel .....	1925																	
Broke, ex-Rooke .....	1925																	
Bruce .....																		
Douglas .....																		
Campbell .....																		
Mackay, ex-Clover-house .....	Cammell Laird .....	1918	332 6	21 9	12 3	2	1530	40,000	36·5	5 4'-7-in. 1 3-in. A.A. 2 2-pr. A.A.	2 T. 21"	182						
Malcolm .....	1919																	
Montrose .....	Hawthorn Leslie	1918							1 M., 4 L.									

1 Flotilla leader (1934 programme) is authorised for commencement in 1936 by contract (see page 202).

## DESTROYERS.

Name or Number.	Built by.	Completed.	Dimensions.				Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity, Oil.						
			Length (Extreme).	Beam.	Draught.	Number of Screws.												
<i>Greyhound, Fearless, Eclipse, Defender, Crusader, Beagle, and Ascosa Classes:</i>																		
Greyhound .....	Vickers-Armstrong																	
Griffin .....	Fairfields	Bldg. (est. 1936)	..	..	..	..		..	..	..	..	..						
Garland .....	Stephen & Sons																	
Gipsey .....																		
Gallant .....																		
Grenade .....																		
Grafton .....																		
Glowworm .....	Thornycroft																	
Fearless .....	Cammell Laird																	
Foresight .....																		
Foxhound .....	Brown	Bldg. (est. 1936)	329	33 3	8 6	2	1375	36,000	35½	4 4'-7-in. 2 6-in. M. 5 smaller.	2 Q. 21"	..						
Fortune .....	J. S. White																	
Forester .....	Parsons/Vickers-Armstrong																	
Fury .....																		
Fame .....																		
Firedrake .....																		
Eclipse .....	Denny .....																	
Echo .....	Scotts .....																	
Escapade .....	Hawthorn Leslie	1934	329	33 3	8 6	2	1375	36,000	35½	4 4'-7-in. 2 6-in. M. 5 smaller.	2 Q. 21"	..						
Escort .....																		
Electra .....																		
Encounter .....																		
Eak .....																		
Express .....																		
Defender .....																		
Diamond .....	Vickers-Armstrong																	
Daring .....	Thornycroft																	
Decoy .....																		
Dainty .....	Fairfield .....	1932—1933	317½ (b.p.)	33	8 6	2	1375	36,000	35½	4 4'-7-in. 1 3-in. A.A. 7 smaller	2 Q. 21"	..						
Delight .....																		
Diana .....	Palmers .....																	
Duchess .....																		

Torpedo tubes: D. = double.

T. = triple

Q. = quadruple.

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## Great Britain—continued.

Name or Number.	Built by.	Completed.	Dimensions.						Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes. (War.)	Complement (War.)	Fuel Capacity. Oil.
			Length (extreme),	Beam.	Draught,	Number of Screws.	Standard Displacement.							
<b>DESTROYERS—</b>														
Crusader ..	{ Portsmouth Dockyard Vickers-Armstrong }	1932	317 $\frac{1}{2}$ (b.p.)	33	8 6	2	1375	36,000	35 $\frac{1}{2}$	4 4.7-in., 1 3-in. A.A., 2 2-pr., 1 M., 4 L.	2 Q. 21"	..	470	
Comet ..														
Cygnet ..														
Crescent ..														
Basilisk ..	Brown ..													
Beagle ..	Hawthorn, Leslie	1931	323	32 $\frac{1}{2}$	8 $\frac{1}{2}$	2	1360	34,000	35	4 4.7-in., 2 2-pr., 1 M., 4 L.	2 Q. 21"	140	390	
Blanche ..														
Boadicea ..	Palmers ..	1931	323	32 $\frac{1}{2}$	8 $\frac{1}{2}$	2	1360	34,000	35	4 4.7-in., 2 2-pr., 1 M., 4 L.	2 Q. 21"	140	390	
Boreas ..	" ..													
Brazen ..	" ..													
Brilliant ..	Swan, Hunter													
Bulldog ..	" "													
Acasta ..	Brown ..	1930												
Achates ..	Brown ..	1930												
Acheron ..	Thornycroft	1931												
Active ..	Hawthorn Leslie	1930												
Antelope ..	Hawthorn Leslie	1930												
Anthony ..	Scotts ..	1930												
Ardent ..	Scotts ..	1930												
Arrow ..	Vickers-Armstr.	1930												
<i>Thornycroft Type:</i>														
Amazon ..	Thornycroft	1927	323	31 $\frac{1}{2}$	9	2	1350	39,500	37	4 4.7-in., 2 2-pr., 1 M., 4 L.	2 Q. 21"	140	423	
<i>Yarrow Type:</i>														
Ambuscade ..	Yarrow ..	1927	322	31	8 $\frac{1}{2}$	2	1170	33,000	37	4 4.7-in., 2 2-pr., 1 M., 4 L.	2 Q. 21"	140	385	
<i>Admiralty "S" Class:</i>														
Sabre ..	Stephen ..	1918												
Shamrock ..	Doxford ..	1919												
Saladin ..	Stephen ..	1919												
Sardonyx ..	" ..	1919												
Scimitar ..	Brown ..	1918												
Seafire ..	" ..	1918												
Searcher ..	" ..	1918												
Serene ..	" ..	1919												
Spindrift ..	Fairfield ..	1919												
Turbulent ..	Haw. Leslie	1919												
Tenedos ..	" ..	1919												
Thanet ..	" ..	1919												
Thracian ..	" ..	1922												
Stronghold ..	Scott ..	1919												
Sturdy ..	" ..	1919												
Sportive ..	Swan Hunter	1918												
Swallow ..	Scott ..	1918												
Trojan ..	J. S. White	1918												
Trusty ..	" ..	1919												
Senator ..	Denny ..	1918												
Scout ..	Brown ..	1918												
Scotsman ..	" ..	1918												
Shikari ..	Doxford ..	1924	Chatham	276	26 $\frac{1}{2}$	10 $\frac{5}{8}$	2	905	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 Q. 21"	103	301
<i>Admiralty "V" Class:</i>														
Vansittart ..	Beardmore ..	1919												367
Venomous ..	Brown ..	1919												353
Verity ..	" ..	1919												363
Volunteer ..	Denny ..	1919												370
Veteran ..	Brown ..	1919												363
Wanderer ..	Fairfield ..	1919												367
Wren ..	Yarrow ..	1923												370
Whitshead ..	Swan Hunter	1919												368
Wild Swan ..	" ..	1919												368
Witherington ..	J. S. White	1919												365
Wivern ..	" ..	1919												365
Wolverine ..	" ..	1920												365
Worcester ..	" ..	1922												365
Whitehall ..	Swan Hunter ..	1925	Chatham	312	29 $\frac{1}{2}$	10 $\frac{5}{8}$	2	1120	27,000	34	6 4-in., 2 2-pr., 1 M., 4 L.	2 T. 130	120	367
Walpole ..	Doxford ..													
Whitely ..	" ..	1918												
Wryneck ..	Palmer ..	1918												
Windsor ..	Scott ..	1918												
Wrestler ..	Swan Hunter ..	1918												
Wessex ..	Haw. Leslie	1918												
Winchester ..	J. S. White ..	1918												
Wolfhound ..	Fairfield ..	1918												

## Great Britain—continued.

Name or Number.	Built by.	Completed.	Dimensions.				Number of Screws.	Standards Displacement.	Horse-Power.	Mean Speed on Trial, or expected.	Armament.	Torpedo Tubes.	Complement (War.).	Fuel. Oil.
			Length (Extreme)	Beam.	Draught.	Feet.								
<b>DESTROYERS—</b>														
<i>Admiralty</i> "V" Class—contd.														
Westminster ..	Scott ..	1918												
Westcott ..	Denny ..	1918												
Wakeful ..	Brown ..	1917												
Walker ..	Denny ..	1918												
Walrus ..	Fairfield ..	1918	312	29½	10·7	2	1100	27,000	34					
Warwick ..	Haw. Leslie ..	1918												
Watchman ..	Brown ..	1918												
Whirlwind ..	Swan, Hunter ..	1918												
Winchelsea ..	J. S. White ..	1918												
Vanessa ..	Beardmore ..	1918												
Vanity ..	" ..	1918												
Vidette ..	Stephen ..	1918												
Vivien ..	Yarrow ..	1918												
Valentine ..	C. Laird ..	1917												
Valkyrie ..	Denny ..	1917												
Valorous ..	" ..	1917												
Vimy (late Vancouver) ..	Beardmore ..	1918												
Vanoc ..	Brown ..	1917												
Vanquisher ..	" ..	1917												
Vectis ..	J. S. White ..	1917	312	29½	10½	2	1090	27,000	34					
Vega ..	Doxford ..	1917												
Velox ..	" ..	1918												
Venetia ..	Fairfield ..	1917												
Venturous ..	Denny ..	1917												
Verdun ..	Haw. Leslie ..	1917												
Versatile ..	Stephens ..	1918	" ..	" ..	" ..	" ..	" ..	" ..	" ..	" ..				
Vesper ..	Stephen ..	1918												
Vimiera ..	Swan Hunter ..	1917												
Violent ..	" ..	1917												
Vivacious ..	Yarrow ..	1917												
Vortigern ..	J. S. White ..	1918												
<i>Thornycroft</i> "V" Class:														
Witch ..	Thornycroft { (Devonport } 1924	1924	312	30½	10·9	2	1140	30,000	35	4 4·7 in., 2 2-pr., 1 M., 4 L.	2 T.	130		
Wishart ..	Thornycroft ..	1920												
Woolston ..	" ..													
Wolsey ..	" ..													
Viceroy ..	" ..													
Viscount ..	" ..													
<i>Admiralty "R" Class:</i>														
Tempest ..	Fairfield ..	1917												
Thisbe ..	Haw. Leslie ..	1917												
Thruster ..	" ..	1917												
Torrid ..	Swan Hunter ..	1917	276—	26½	10½	2	900	27,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D.	98	296—	
Skate ..	Brown ..	1917	276½	25½	9½	2								298
Rowena ..	" ..	1916												
Restless ..	" ..	1916												
Sable ..	H. & Wolff ..	1916												
<i>Yarrow "R" Class:</i>														
Tyrant ..	Yarrow ..	1917	271½	25½	9½	2	760	23,000	36	3 4-in., 1 2-pr., 1 M., 4 L.	2 D.	98	256	

<sup>8</sup> Destroyers, 1934 programme, are authorised for commencement, by contract, in 1935 (see page 202).

## Great Britain—continued.

## SUBMARINES.

Name or Number.	Where Built.	Completed.	Dimensions.				No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes	Complement (Wat.)	Fuel Capacity Oil.	
			Length. (Extreme)	Beam.	Draught.	Feet.	Feet.	Feet.							
<i>Thames Class:</i>															
Thames ..	Vickers-Armstrong	1932	345	28	13·5	..	..	..	1,805 2,680 1,850 2,710	10,000 2,500 1,630	21 $\frac{1}{2}$ 10 8 $\frac{1}{2}$	1 4·7-in., 2 smaller	6	..	224
Severn ..	Vickers-Armstrong	1934	..	..	..	..	..	..	..	..	..	..	..	..	210
<i>Porpoise Class:</i>															
Porpoise ..	Vickers-Armstrong	1933	289	29·8	13·8	..	..	..	1,500 2,060	8,300 1,630	15 8 $\frac{1}{2}$	1 4·7 in.	..	..	155
Grampus $\dagger$ ..	Chatham ..	Bldg.	..	..	..	..	..	..	..	..	..	..	..	..	..
Narwhal $\ddagger$ ..	Vickers ..														..
<i>Swordfish Class:</i>															
Starfish ..	Chatham ..	1933	202·5	24	10·5	..	..	..	640 935	1,550 1,300	13 $\frac{1}{2}$ 10	1 Lewis	6	..	44
Seahorse ..	Chatham ..														..
Swordfish ..	Chatham ..														..
Sturgeon ..	Chatham ..														..
Sealion ..	Cammell Laird														..
Salmon ..	Cammell Laird														..
Shark ..	Chatham ..														..
Snapper ..	Chatham ..														..
Seawolf $\ddagger$ ..	Scott's ..	Bldg.	..	..	..	..	..	..	..	..	..	..	..	..	..
<i>Rainbow Class:</i>															
Rainbow ..	Chatham ..	1932	290	29·8	13·8	..	..	..	1,475 2,015	..	..				
Regent ..	Vickers-Armstrong	1930													
Regulus ..	Vickers-Armstrong	1930													
Rover ..	Vickers-Armstrong	1931													
<i>Parthian Class:</i>															
Parthian ..	Chatham ..	1931													
Perseus ..	Vickers-Armstrong	1930	290	29·8	13·7	..	..	..	1,475 2,040	4,400 1,320	17 $\frac{1}{2}$ 9	1 4-in. (Perseus has 1 4·7 in.)	8	53	156
Proteus ..	Vickers-Armstrong	1930													
Pandora ..	Vickers-Armstrong	1931													
Phoenix ..	Cammell Laird														
<i>Odin Class:</i>															
Odin ..	Chatham ..	1929													
Olympus ..	Beardmore ..	1930													
Orpheus ..	Beardmore ..	1930													
Oasis ..	Vickers ..	1929	283 $\frac{1}{2}$	29·8	13·7	..	..	..	1,475 2,030	4,400 1,320	17 $\frac{1}{2}$ 9	1 4-in., 2 Lewis	8	53	174
Oswald ..	Vickers ..	1929													
Otus ..	Vickers ..														
<i>Oboron Class:</i>															
Oberon ..	Chatham ..	1927	270	28	13·2	..	..	..	1,311 1,830	2,950 1,850	15 9	1 4-in., 2 Lewis	8	53	185
Oxley* ..	Vickers ..	1927	275	27·7	13·8	..	..	..	1,350 1,870	3,000 1,350	15 $\frac{1}{2}$ 9	1 4-in., 2 Lewis	8	53	195
Otway* ..	Vickers ..														
<i>X Type:</i>															
X1 ..	Chatham ..	1925	363 $\frac{1}{2}$	29·8	15·3	..	..	..	2,425 3,600	7,000 2,600	19 $\frac{1}{2}$ 9	4 5·2 in., 2 Lewis	6	100	450
<i>L 50 Class:</i>															
L71 ..	Scott's ..	1920													
L69 ..	Beardmore ..	1923													
L56 ..	Fairfield ..	1919													
L54 ..	Denny ..	1924	235	23·5	12	..	..	..	845 1,150	2,400 1,600	17 $\frac{1}{2}$ 10 $\frac{1}{2}$	1 4-in., 1 Lewis	6	44	110
L53 ..	Armstrong ..	1925													
L52 ..	Armstrong ..	1921													
<i>L Class:</i>															
L27 ..	Vickers ..	1926													
L26 ..	Vickers ..	1926													
L25 $\dagger$ ..	Vickers ..	1920													
L23 ..	Vickers ..	1924													
L22 ..	Vickers ..	1921	238 $\frac{1}{2}$	23 $\frac{1}{2}$	11·7	..	..	..	760 1,080	2,400 1,600	17 $\frac{1}{2}$ 10 $\frac{1}{2}$	1 4-in., 1 Lewis (L25 carries 14 mines in addition)	4	41	76
L21 ..	Vickers ..	1920													
L20 ..	Vickers ..	1919													
L19 ..	Vickers ..	1919													
L18 ..	Vickers ..	1919													

\* Transferred from the Royal Australian Navy in 1931.

 $\dagger$  1933 programme. $\dagger$  Minelaying submarines.

## Great Britain—continued.

## SUBMARINES—continued.

Name or Number.	Where Built.	Completed.	Dimensions.			No. of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement (War).	Fuel Capacity Oil.
			Length (Extreme)	Beam.	Draught.								
			Feet.	Feet.	Feet.								
<b>H Class:</b>													
H50 . . . . .	Beardmore ..	1920											
H49 . . . . .	Beardmore ..	1919											
H48 . . . . .	Beardmore ..	1919											
H44 . . . . .	Armstrong ..	1920											
H43 . . . . .	Armstrong ..	1919											
H34 . . . . .	Cammell Laird ..	1919											
H33 . . . . .	Cammell Laird ..	1919											
H32 . . . . .	Vickers ..	1919											
H31 . . . . .	Vickers ..	1919											
H30 . . . . .	Vickers ..	1918											
H28 . . . . .	Vickers ..	1918											
H27 . . . . .	Vickers ..	1918											
			171	15·75	12·5	..	410 500	480 320	13 10½	1 Lewis	4	23	16

3 submarines, 1934 programme, are authorised for commencement in 1935 (1 at Chatham dockyard and 2 by contract).

## SLOOPS

Name.	Displacement.	Length (Extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. Oil.	Complement.
<b>SLOOPS.</b>													
<i>Convoy Sloop:</i>													
*Enchantress*	1190	266 b.p.	37 0	8 6	3,000	J. Brown	J. Brown	..	Bldg.	4·7-in. guns.	18	370	..
<i>Coastal Sloop:</i>													
Kingfisher*	535	234 b.p.	26 6	6 6	3,600	Fairfield	Fairfield	..	Bldg.	4-in. gun.	20	—	..
<i>Grimsby Class:</i>													
Grimsby . . .	1060†	250	36 0	7 6	2,100	Devonport	J. S. White	1933	1934	2 4·7-in. guns. 1 3-in. 12 smaller	17	..	..
Leith . . . . .													
Lowestoft . . .													
Wellington . . .													
*Londonderry . . .	..	..	..	..	..	Devonport	..	1935	..	..	..	..	..
*Deptford . . .	..	..	..	..	..	Chatham	..	1934	..	..	..	..	..
<b>SLOOP MINE-SWEEPERS.</b>													
<i>Halcyon Class:</i>													
Halcyon . . . . .	..	..	..	..	..	J. Brown	J. Brown	1934	1934	2 4-in., 1 2-pr.	16½ est.	220	..
Skipjack . . . . .	875†	246	33 6	7 3	1,770	Thornycroft	Thornycroft	1934	1934	2 4-in., 1 2-pr.	16½ est.	220	..
Harrier . . . . .													
Husar . . . . .						Hamilton	Beardmore	..	Bldg.				
Speedwell . . . . .													
<i>Repeat Shoreham Class:</i>													
Falmouth . . . . .													
Millford . . . . .	1105†	281 4	35 0	8 3	2,000 P.T. (G.)	Devonport	Hawthorn Leslie Yarrow Yarrow	1932	1932	1 4-in., 1 4-in. A.A. 4 3-pr.	10-16½	—	290
Weston . . . . .							Hawthorn Leslie	1933	1933	8 L.			..
Dundee . . . . .													

\* 1933 Programme.

† Estimated displacement.

‡ Ex Bittern. In addition to her normal duties Enchantress will be made available for occasional use by the Board of Admiralty. The old Enchantress—the Admiralty yacht—is to be sold.

Great Britain—*continued.*S LOOPS.—*continued.*

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where Built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (Knots).	Coal. Oil.	Complement.
<i>Shoreham Class:</i> Bideford .						Devonport	J. S. White & Devonport	1931	1931				
Rochester .						Chatham	J. S. White & Chatham	1932	1932	1 4-in., 1 4-in. A.A. 4 3-pr. 8 L.	16-	290	..
Fowey .	1105*	281 4	35 0	8 0	2,000 P.T. (G.)	Devonport	J. S. White & Devonport	1930	1931				
Shoreham .						Chatham	J. S. White & Chatham	1930	1931				
<i>Hastings Class:</i> Hastings .	1025					Devonport	Devonport	1930	1931	1 4-in., 1 4-in. A.A. 2 3-pr. 8 L.	16-	—	..
Penzance .						Devonport	Devonport	1930	1931				
Folkestone .						Swan, Hunter	Hawthorn, Leslie	1930	1930				
Scarborough .	1045	266 4	34 1	9 1	2,000 P.T. (G.)	Swan, Hunter	Hawthorn, Leslie	1930	1930				
<i>Bridgewater Class:</i> Bridgewater Sandwich	1045	266 4	34 0	8 6	2,000 P.T. (G.)	Hawthorn Leslie	Hawthorn Leslie	1928	1929	1 4-in., 1 4-in. A.A., 4 L.	16-	—	275
											16+	275	95
<i>Anchusa Class:</i> Harebell .	1345	274 9	35 0	12 0	2,500 recip.	Barclay Curle	Barclay Curle	1918	1918	2 4-in., 2 12-pr., 2 L.	16-5	—	320
											—	260	119
Chrysanthemum .	1345	276 0	35 0	13 3	2,500 recip.	Armstrong	Wallsend Slipway	1917	1918	2 3-pr.	16-5	—	100
Bryony .	1345	275 3	35 0	12 10	2,500 recip.	Armstrong	Wallsend Slipway	1917	1917	1 M., 8 L.	16-5	—	70
<i>Arabis Class:</i> Godetia .						C. Connell	Rowan	1916	1916	1 4-in., 1 12-pr., 2 L.		255	—
Lupin† .	1175	267 9	33 6	12 0	2,000 recip.	Simons	Simons	1916	1916	2 4-in., 4 3-pr., 1 2-pr., 8 L.	16-	—	100
											17	182	
Rosemary .						Richardson Duck	Blair	1915	1916	1 4-in., 2 2-pr., 2 M., 8 L.		260	—
<i>Azalea Class:</i> Heliotrope § .	1163	262 6	33 0	12 8	1,800 recip.	Lobnitz	Lobnitz	1915	1915	4 3-pr., 1 4-in., 2 2-pr., 2 M., 8 L.	16-17	250	100
<i>Acacia Class:</i> Daffodil § .						Scott's	Scott's						
Laburnum § .	1165	262 6	33 0	12 6	1,800 recip.	Connell	Rowan						
Veronica § .						Dunlop	Dunlop						
Foxglove .						Bremner	Bremner	1915	1915	2 4-in., 4 3-pr., 2 2-pr., 8 L. (Daffodil and Foxglove 2 M.)	16-17	250	100

\* Estimated displacement.

† Converted to oil-burning.

‡ Fishery protection ships

§ To be scrapped.

6 sloops, 1934 programme, are authorised for commencement in 1935, 2 at Devonport Dockyard, 2 sloop minesweepers and 2 coastal sloops by contract.

**Great Britain—continued.**  
**TWIN-SCREW MINESWEEPERS, RIVER GUNBOATS.**

Name.	Displacement.	Length (extreme).	Beam (extreme).	Draught.	Horse-Power.	Where built.	Maker of Machinery.	Date of Launch.	Date of Completion.	Armament.	Speed (knots).	Coal. Oil.	Complement.
<b>TWIN-SCREW MINE- SWEEPERS.</b>													
Aberdare . .						Ailsa	Ailsa	1918	1918				
Abingdon . .						Ailsa	G. Clark						
Albury . .						Ailsa	Ailsa	1918	1919				
Alresford . .						Ailsa	W. H. Allen	1919	1919				
Bagshot . .						Ardrossan	W. H. Allen	1918	1919				
Derby . .						Dry Dock Co.							
Dundalk . .						Clyde S.B. Co.	Clyde S.B. Co.	1918	1918				
Dunoon . .						Do.	Do.						
Fermoy . .						Do.	Do.						
Fareham . .						Dundee S.B. Co.	Cooper & Greig	1919	1919				
Forres . .						Dunlop,	Dunlop,	1918	1918				
Tiverton . .						Bremner	Bremner						
Elgin . .						Clyde S.B. Co.	G. Clark	1918	1919				
Caterham . .	710	231 0	28 7	9 0	2,200 recip.	Simons	Simons	1918	1918				
Carstairs . .						Do.	Do.						
Sutton . .						Bow,	Bow,	1919	1919	1 L-in., 1 12- pr. A.A.	16	186	73
Saltash . .						McLachlan	McLachlan			Alresford, Caterham,			
Saltburn . .						Do.	Do.			Carstairs and Saltburn no armament.			
Selkirk . .						McMillan	Yarrow	1918	1918	Ross and Forres, 16-pr. only.			
Ross . .						Murdock & Murray	Do.						
Widnes . .						Do.	Do.						
Harrow . .						Lobnitz	Lobnitz	1918	1919				
Huntley . .						Napier &	Napier &						
Lydd . .						Miller	Miller						
Stoke . .						Eltringham	Eltringham	1918	1918				
Pangbourne . .						Do.	Do.						
Tedworth . .	675	231 0	28 0	9 0	1,800 recip.	Fairfield	Fairfield	1919	1919				
<b>RIVER GUN- BOATS.</b>						C. Renold- son	Shields Eng. Co.	1918	1918				
Robin . .	226	150 b.p.	26 8	3 0	800 recip.	Lobnitz	Lobnitz	1917	1917	1 3-in. A.A.	14	140	35
Sandpiper . .	185	160 0 b.p.	30 8	1 10	600 recip.	Simons	Simons						
Falcon . .	372	150 0	28 8	4 9	2,250 (G.)	Yarrow	Yarrow	1934	Bldg.	1 3-7-in. Howit- zer, 1 6-pr., 8 L.	12	140	
Gannet . .	310	185 0	29 0	4 0	2,250 (G.)	Yarrow	Yarrow	1933	1933	1 3-7-in. Howit- zer, 1 6-pr., 8 L.	11	28	
Peterel . .						Yarrow	Yarrow	1931	1931	1 3-7-in. Howit- zer, 2 6-pr., 8 L.	15		
Seamew . .						Do.	Do.	1927	1928	2 3-in. A.A., 8 L.	16	60	60
Tern . .	262	168 0	27 0	4 0	1,370 (G.)	Do.	Do.	1928	1928				
Aphis . .						Ailsa	Ailsa	1927	1927				
Bee . .						Do.	Do.	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.	14	50	60
Cicala . .						Barclay Curle	Barclay Curle	1915	1916	1 3-in. A.A., 2 3-pr., 1 2-pr., 8 L.	100		
Cockchafer . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 8 L.	35		
Cricket . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 8 L.	55		
Gnat . .	625	237 6	36 0	4 6	2,000 recip.	Lobnitz	Lobnitz	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.	14	100	55
Ladybird . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.			
Mantis . .						Sunderland S.B. Co.	N.E. Marine	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.			
Moth . .						Do.	Do.	1915	1916	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.			
Scarab . .						Wood, Skinner	Do.	1915	1915	2 6-in., 1 3-in. A.A., 1 2-pr., 8 L.			
Tarantula . .						Do.	Do.	1915	1916	1 6-in., 1 3-in. A.A., 1 2-pr., 8 L.			

## Argentine Republic.

Name or Number.	Where Built.	Launched	Dimensions.				Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme.)	Beam.	Draught.	Number of Screws.							
FLOTILLA LEADERS—													
Cervantes (ex-Spanish Churruca)													
Juan de Garay (ex- Spanish Alcalá Galiano)	Cartagena ..	1925	331 $\frac{1}{2}$	31 $\frac{1}{2}$	10 $\frac{1}{2}$	2	1650	42,000	26	5 4·7 in., 1 3-in. A.A., 4 M.	2 triple 21-in.	—	Tons.
Mendoza ..	J. S. White, Cowes	1928	318 $\frac{1}{2}$	31·8	12 $\frac{1}{2}$	2	1520	45,000	36 (La Rioja 39·4 t.)	5 4·7 in., 1 3-in. A.A., 2 2-pr. 4 M.	2 triple 21-in.	160	—
La Rioja ..		1929											
Tucuman ..		1929											700
DESTROYERS—													
Catamarca ..	Schichau	1911	288·7	27 $\frac{1}{2}$	10	2	972	18,000	32	3 4-in. 2 1-pr.	4 21-in.	100	—
Jujuy $\dagger$ ..	Germania ..												
Cordoba $\ddagger$ ..	Schichau ..	1910	295 $\frac{1}{2}$	29·5	10	..	1000	28,000	34·7 t.	3 4-in. 2 1-pr.	4 21-in.	100	—
La Plata $\ddagger$ ..	Germania ..	1911											
SUBMARINES—													
Santa Fe ..		1931											
Salta ..	Taranto ..	1932	226 $\frac{1}{2}$	21 $\frac{1}{2}$	13	2	850	3,000	17·5	1 4·7-in. 1 2-pr. A.A.	8 21-in.	41	—
Santiago del Estero ..		1933						1,300	9				

\* Converted to oil-burning, 1927, at Buenos Aires.

† Converted to oil-burning at Buenos Aires.

3 flotilla leaders and 3 submarines are projected.

## Brazil.

Name or Number.	Where Built.	Launched	Dimensions.				Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme.)	Beam.	Draught.	Number of Screws.							
DESTROYERS—													
Para ..	*	1908											
Plabuy ..		1908											
Matto Grosso ..		1908											
Parahyba ..		1909											
Rio Grande del Norte ..	Yarrow ..	1909	240	28·6	7·5	2	560	8,000	27 (27·1- 26·7 on trials)	2 4-in., 4 3 prs.	2 18-in.	75	140
Alagoas ..		1909											
Santa Catharina ..		1909											
Parana ..		1910											
Sergipe ..		1909											
Maranhao (ex-Por- tuguese) ..	Thornycroft ..	1913	265·3	26·5	10	..	934	22,500	31	{ 3 4-in., (1 2-pr.	2 dbl. 21-in.	..	— 250
SUBMARINES—													
Humayta ..	Spezia (Ansaldo Fiat)	1927	282	25·6	14	2	1450	4,800	18·5	{ 1 4-in. A.A.; carries mines	6 21-in.	55	—
F 1 ..							1,884	2,200	10				
F 3 ..	Spezia (Fiat)	1913	150	13·8	12	..	250	700	13·5		2 18-in.	..	..
F 5 ..							370	500	8				

\* In bad condition.

9 destroyers of 1,600 tons, 6 submarines of 1,003 tons, and 6 submarines of 800 tons are approved to be built in eight years. Orders have not yet been placed, except for three destroyers to be built at the naval dockyard on the Ilha das Cobras.

## Chile.

Name or Number.	Where Built.	Launched.	Dimensions.				Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal Oil
			Length (Extreme.)	Beam.	Draught.	Feet.								
<b>DETECTORES—</b>														
Serrano .. .														
Orella .. .														
Equelme .. .														
Hyatt .. .														
Videla .. .														
Aldea .. .														
Almirante Lynch .. .														
Almirante Condell .. .														
Almirante Riveros (ez-Faulknor) .. .														
Almirante Uribe (ez-Broke) .. .														
Almirante Williams (ez-Botha) .. .														
<b>SUBMARINES—</b>														
Capitan Thompson .. .		1928	300	29	9	2	1090	28,000	35	3 4·7-in., 1 3-in. 21-in.	2 triple	130	—	340
Capitan Simpson .. .	Thornycroft's	1912	320	32·6	11·1	3	1850	30,000	31	6 4-in. 4 M.	4 18-in.	190	427	80
Capitan O'Brien .. .	White .. .	1913	p.p.	p.p.										
H 1 .. .														
H 2 .. .														
H 3 .. .														
H 4 .. .														
H 5 .. .														
H 6 .. .														
Fore River, U.S.A.	1915	150·3	15·75	12·3	..	3	1700 (to 1740)	30,000	31	3 4·7-in., 2 4-in.. or 2 21-in. 2-pdr. A.A.	4 18-in.	174	403	83

3 submarines are projected (no money voted).

## Denmark.

Name or Number.	Where built.	Launched.	Dimensions.				Number of Screws.	Displacement.	Horse Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel. Coal Oil
			Length (Extreme.)	Beam.	Draught.	Feet.								
<b>TORPEDO BOATS. FIRST CLASS—</b>														
Glenitin .. .														
Hogen .. .														
Ornen .. .														
Laxen .. .														
Dragen .. .														
Hvalen .. .														
R4. Havgatten †		1919												
R5. Sælen †		1919												
R3. Nordkaperen †	Royal Dockyard, Copenhagen	1918												
R2. Makrelen †		1918												
S6. Narhvalen .. .		1917												
S5. Havhesten .. .		1917												
S4. Sölhunden .. .		1917												
S3. Sölöven .. .		1916												
S2. Storen .. .		1916												
S1. Springeren .. .														
P1. Hvalrossen †		1913	148·2	16·9	7·5	2	158	3,480	26·2 t.	2 6-pr. A.A. (1 in R2-4)	2 2	22	15	—
O3. Sölvulen .. .	Burmeister, Copenhagen	1911												
O2. Flyvefisken .. .		181·7	18	9·7	2	222	5,000	27·5	2 3-in.	5 18"	33	80	—	
O1. Sördideren .. .	Yarrow & Co.	1911												
N3. Speakhuggeren .. .	Royal Dock., Copenhagen	1911	184·8	19·1	7·1	2	247	5,000	27·5	2 3-in.	5 18"	34	80	—
N2. Vindhunden .. .	Schichau													
N1. Tumleren .. .														
<b>SUBMARINES—</b>														
Daphne. D1 .. .	Royal Dockyard, Copenhagen	1926	161	16	8·2	..	305	900	13·4 7	1 3-in. A.A.	6 18"	18	16	—
Dryaden. D2 .. .														
Flora. C3 .. .														
Bellona. C2 .. .		1919	155·7	14·4	3·8	..	301	900	14·5 10·5	1 6-pr.	5 18"	17	13	—
Rota. C1 .. .														
Galathea. B12 .. .														
Neptun. B11 .. .														
Triton. B10 .. .														
Ran. B9 .. .														
Aegir. B8 .. .														

\* Used as minesweepers.

† Used as patrol vessels.

## France.

Name or Number.	Where Built.	Launched.	Dimensions.				Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.	Tons.								Coal Oil
FLOTILLA LEADERS—														
Volta .. . . .	Ch. de Bretagne, Nantes	Bldg.	..	..	..	2,930	..	..	..	..	..	..	..	..
Mogador .. . . .	Lorient .. .	Bldg.	..	..	..	2,569	..	..	..	..	..	..	..	..
Le Fantasque .. . . .	Lorient .. .	1934	426	39 $\frac{1}{4}$	14									
L'Audacieux .. . . .														
Le Malin .. . . .	Ch. de la Méditerranée													
L'Indomptable .. . . .														
Le Triomphant .. . . .	Ch. de France	1934	435	39	14									
Le Terrible .. . . .														
Vauquelin .. . . .	Ch. de France, Dunkirk	1932												
Kersaint .. . . .	Ch. de la Loire, Nantes	1931												
Cassard .. . . .	Ch. de Bretagne, Nantes	1932												
Tartu .. . . .	Ch. de la Loire, Nantes	1931	423	38 $\frac{1}{2}$	14	2	2,441	74,000	37	{ 5 5·5-in., { 4 1-pr. A.A. }	{ 9 in. 21·7	220	..	
Maillié Brézé .. . . .	Ch. de Pnhoet, St. Nazaire	1931												
Le Chevalier-Paul .. . . .	Ch. de la Méditerranée, Havre	1932												
Aigle .. . . .	Ch. de France, Dunkirk													
Vautour .. . . .	Ch. de la Méditerranée, Havre													
Albatros .. . . .	Ch. de la Loire, St. Nazaire	1930	426	38	14	2	2,441	74,000	37	{ 5 5·5-in., { 4 1-pr. A.A. }	{ 6 in. 21·7	220	..	
Gerfaut .. . . .	Ch. de Bretagne, Nantes													
Milan .. . . .	Lorient .. .	1930-	426	38	14	2	2,441	75,000	37	{ 5 5·5-in., { 4 1-pr. A.A. }	{ 7 in. 21·7	220	..	
Epervier .. . . .	Ch. de Penhoet, St. Nazaire	1928												
Valmy .. . . .	Ch. de la Loire, St. Nazaire	1928												
Verdun .. . . .	Ch. de la Loire, St. Nazaire	1928												
Vauban .. . . .	Ch. de France	1930	427	37 $\frac{3}{4}$	15	2	2,436	70,000	36	{ 5 5·5-in., { 4 1-pr. A.A. }	{ 6 in. 21·7	216	—	
Lion .. . . .	Dunkirk ..	1929												
Bison .. . . .	Lorient ..	1928												
Gépard .. . . .	Lorient ..	1928												
Chacal .. . . .	St. Nazaire ..	1924												
Jaguar .. . . .	Lorient Dy.	1923												
Leopard .. . . .	St. Nazaire ..	1924												
Lynx .. . . .	"	1925												
Panthère .. . . .	Lorient Dy.	1924												
Tigre .. . . .	Nantes ..	1924												
Amiral Sévénus, ex-German	Germany ..	1917	346·5	33·5	14·8	2	1,526	44,000	34	4 5·9-in., 2 1-pr.	2 D.	180	—	
S. 113														
DESTROYERS—														
Le Hardi .. . . .	Ch. de Graville.	Bldg.	..	..	..	..	1,378	..	..	4 5·1-in.	..	..	..	
Forbin .. . . .	Le Havre	1928												
Frondeur .. . . .	Ch. Navals François, Caen	1929												
Fougueux .. . . .	Ch. de Bretagne, Nantes	1928												
Foudroyant .. . . .	Ch. de Dyle et Bacalon, Bordeaux	1929												
Basque .. . . .	Maritime ..	1929	351·7	32·2	10·2	..	1,378	35,000	34	{ 4 5·1-in., { 2 1-pr. A.A. }	{ 6 in. 21·7	146	—	
Bordelais .. . . .	Bordeaux ..	1928												
Boulonnais .. . . .	Caen ..	1927												
Brestois .. . . .	Nantes ..	1927												
L'Adroit .. . . .	Dunkirk ..	1927												
L'Alcyon .. . . .	Bordeaux ..	1927												
Le Fortune .. . . .	Bordeaux ..													
Le Maré .. . . .	Caen ..	1926												
La Palme .. . . .	Nantes ..													
La Raillouse .. . . .	Nantes ..													
Bourrasque .. . . .	Dunkerque	1925												
Cyclone .. . . .	Havre ..	1925												
Mistral .. . . .	"													
Orage .. . . .	Caen ..	1924												
Ouragan .. . . .	"													
Simoun .. . . .	St. Nazaire ..													
Sirocco .. . . .	Rouen ..	1924	346 $\frac{1}{2}$	31·7	10·2	2	1,319	33,000	33	{ 4 5·1-in., { 1 3-in. A.A. }	{ 6 in. 21·7	140	—	
Tempête .. . . .	Nantes ..	1925												
Tramontane .. . . .	Bordeaux ..	1924												
Trombe .. . . .	Harfleur ..	1924												
Typhon .. . . .	Bordeaux ..	1925												
Tornade .. . . .	Barcelona ..	1925												

1 leader similar to Mogador is projected in the 1934 estimates.

## France—continued.

Name or Number.	Where Built.	Launched.	Dimensions.				Number of Screws.	Displacement.	Horse-Power.	Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme.)	Breadth.	Draught.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Coal/ Oil
DESTROYERS—Contd.														Tons
Ens. Roux, M. P. Lestin	Rochefort ..	1915	271	27	10·5	2	787	18,000	30	{ 2 3·9-in., 1 (3-in., 4 9 pr.	4	18-in.	98	— 206
Ens. Gabolde .. .	Havre .. ..	1921	271	26·9	10·0	2	802	22,000	33	{ 3 3·9-in., 1 (3-in. A.A.	4	21·7-in.	98	— 200
Deligny, ex-S. 139 ..														
Chastang, ex-S. 133 ..														
Vesco, ex-S. 134 ..	Germany ..	1917	272·3	27	11·5	2	787	16,800	28	{ 3 4·1-in., 4 M.	6	19·7-in.	113	— 246
Mazare, ex-S. 135 ..														
Matchot Leblanc, ex-Austrian, Dukla ..	Flume ..	1916	277·5	25·7	11·0	2	748	18,000	30·5	{ 2 3·9-in., 6 (9-pr.	4	21-in.	120	168 152
Téméraire, Intrépide,* Opiniâtre, Aventurier† Annamite,† Algérien, Arabe, Bambara,† Hova, Kabyle, Marocain, Sakalave, Sénégalais, Somali, Tonkinois, Touareg ..	Nantes ..	1911	290·5	28·5	11·5	..	915	24,000	27	{ 4 3·9-in. (13-pr. A.A.	4	18-in.	102	236 74
Japan .. ..	Japan .. ..	1917	272	24	10·5	..	601	11,000	29	{ 1 4·7-in., (3 3-in. (1 3-in. A.A.	2	dbl. 18-in.	106	98 115

1st class torpedo boats (1905-7), Nos. 315, 321, 349, 369, 85 tons, 2000 H.P., 26 knots, 1 3-in. gun, 1-3 torpedo tubes.

\* Converted to oil-burning.

† To be placed on sale list.

CRUISER SUBMARINES—														
Surcouf.. . . . .	Cherbourg ..	1929	393·7	29·5	23	2	Surf. Sub.	Surf. Sub.	Surf. Sub.	2 8-in.	14	21-in.	130	..
SUBMARINES—							2·800	7600	19	2 1-pr.				
Agosta .. . . . .	Cherbourg ..	1934					4300	3400	11					
Beveziers .. . . .														
Ouessant .. . . .	Brest ..	Bldg.	..	..	..	..	1379	8000	17	1 3·9 in.	11	..	..	..
Sidi-Ferruch .. . .										1 smaller				
Stix .. . . . .	Ch. de la													
Casablanca .. . . .	Loire..													
Le Glorieux .. . .	Cherbourg ..	1932												
Le Centaure .. . .	Cherbourg ..	1933												
Le Héros .. . . .	Brest ..	1933	302·8	26·8	15·5	2	1379	6000	17	1 3·9-in.	11	61	..	..
Le Conquerant .. .	Brest ..	1932					1968	2000	10	1·5-in. A.A.				
Le Tonnerant .. . .	Loire ..													
L'Espoir .. . . . .	la Seine ..													
Persée .. . . . .	Ch. Navale													
Protée .. . . . .	Français, Caen													
Pégase .. . . . .	Forge et Ch. de													
Phénix .. . . . .	la Méditerranée la Seyne ..	1930	301·8	26·8	15·5	2	1379	6000	18	1 3·9-in., 1 1·5-in. A.A.	11	61	..	..
Achille .. . . . .							1968	2000	10					
Ajax .. . . . .	Brest ..	1933												
Acheron .. . . . .	Ch. de la Loire,													
Argo .. . . . .	St. Nazaire ..	1929												
Acteon .. . . . .	Ch. Dubigeon,	1930	301·8	26·8	15·5	2	1379	6000	18	1 3·9-in., 1 1·5-in. A.A.	11	61	..	..
Pascal .. . . . .	Nantes ..						1968	2000	10					
Pasteur .. . . . .	Brest ..													
Poncelet .. . . . .	Lorient ..													
Henri Poincaré .. .	Caen ..													
Archimède .. . . .	Ch. de Penhoët,	1928-	302·5	26·8	15·5	2	1379	6000	18	1 3·9-in.	11	61	..	..
Fresnel.. . . . .	St. Nazaire ..	1929					1968	2000	10	1 1·5-in. A.A.				
Monge .. . . . .	Ch. de la Medi- terranean, la													
*Perle .. . . . .	Seyne ..	1933												
*Diamant .. . . . .														
*Ruby .. . . . .	Toulon ..	1930	216·5	23·3	13·5	2	669	1300	13	1 3-in.,	5	40	..	..
*Nautilus .. . . . .		1928					910	800-	9	64 mines				
*Saphir .. . . . .		1929						1000						
*Turquoise .. . . .		1929												
Redoubtable .. . .	Cherbourg ..	1928	302·5	30·5	15·5	2	1384	6000	18	1 3·9-in. A.A.	11	..	..	..
Vengeur .. . . . .		1924					1968	2000	10	1 1-pr. A.A.				
Requin .. . . . .		1925												
Morse .. . . . .	Cherbourg ..	1925												
Narval .. . . . .		1924												
Souffleur .. . . . .		1927	278·8	22·8	15	2	974	2900	16	1 3·9-in. A.A.	10	54	..	..
Caiman .. . . . .	Toulon ..	1925					1415	1800	10					
Dauphin .. . . . .		1926												
Espadon .. . . . .		1924												
Marsouin .. . . . .														
Phoque.. . . . .	Brest ..	1928												

\* Minelayer.

2 submarines are included in the 1934 programme, 1 similar to Agosta and 1 Minerve type.

## France—continued.

Number and Name.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement, Surf/Sub.	Horse-Power.	Speed, Surf/Sub.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal Oil
			Length (Extreme.)	Beam.	Draught.								
Feet.	Feet.	Feet.	Tons.	Knots.									Tons.
SUBMARINES—													
Minerve .. . . .	Cherbourg ..												
Junon .. . . .	Havre ..												
Venus .. . . .	Worms ..												
Iris .. . . .	Dubligeon ..	Bldg.	..	..	..	..	571	..	..	..	..	..	..
Orphée .. . . .													
Oreade .. . . .													
Orion .. . . .	Ch. Normand,												
Ondine .. . . .	Havre ..												
Psyche .. . . .													
Sybille .. . . .	Ch. Normand ..												
Vestale .. . . .	Worms ..												
Sultane .. . . .	Schneider ..	1932											
Amphitrite .. . .	Le Trait ..												
Antiope .. . . .	Havre ..	1932											
Atalante .. . . .	Chalons-sur-												
	Saône ..												
Amazonie .. . . .	Le Trait ..	1932											
Diane .. . . .	Chantiers Nor-												
Meduse .. . . .	mand, Havre ..	1930											
Argonaute .. . . .	Schneider et Cie ..												
Archuse .. . . .	Chalons-sur-												
	Saône ..												
Ariane .. . . .													
Danaé .. . . .	Havre ..	1927											
Eurydice .. . . .													
Circé .. . . .													
Calypso .. . . .	Chalons ..	1928											
Doris .. . . .													
Theonis .. . . .													
Naïade .. . . .													
Sirène .. . . .	St. Nazaire ..	1925											
Nymphé .. . . .													
Galatée .. . . .													
Amphitrite II .. . .	Rochefort ..	1914											
Atalante II .. . .	Toulon ..	1913	177	17·7	10·9	2	384-597	1300	13·7	1 3-in. A.A.	8	..	..
Nérôide .. . . .	Cherbourg ..	1914	243	19·8	12·3	2	771-1070	1200	14	1 3-in. A.A.	21·7	..	..
Bellone, Hermione, Gorgone .. . . .	Rochefort ..	1914 &	198·9	17·7	11·9	2	484-7t3	1500	12	1 3-in.	18·7	30	13
Gorgone .. . . .	Toulon ..	1915						1800	15·5	1 3-in.	18·7	40	14
Gustave Zédé .. . .	Cherbourg ..	1913	243	19·7	12·3	..	771-1080	1500	16	1 3-in.	18·7	47	24
Daphne .. . . .	Cherbourg ..	1915	223	18·0	12·0	2	647-882	1500	11	1 3-in.	18·7	43	24
Joessel, Fulton .. . .	Cherbourg ..	1917	243	20·0	13·4	2	838-1181	2900	17	2 3-in.	8	47	11½
Laplace .. . . .	Rochefort ..	1917						1650	10½	2 3-in.	18·7	47	11½
Lagrange .. . . .	Toulon ..	1917	246	21·0	13·0	2	838-1307	2600	17	2 3-in.	8	47	11½
Romazotti, Regnault .. . .	Toulon ..	1918						1640	11	2 3-in.	18·7	40	14
Armidé (ex-Japanese)													
Amazonie II (ex-Greek)	Schneider ..	1915	184·6	17·0	10	2	420-665	2200	15		6	29	27
								900	10		18·7	27	27
O'Byrne, Henry Fournier .. .	Chalons ..	1919	172	15·6	9·6	..	310-507	1020	14	1 3-pr.	4	24	—
Dupuy de Lôme, Sané .. .	Chalons ..	1916	246	20·9	13·7	..	748-1270	2400	18	2 3-in.	8	40	99
Pierre Chailley .. .	Havre ..	1922	229·7	26·3	13·0	..	798-1181	1660	11	2 3-in.	18·7	43	54
Maurice Calot .. .	Bordeaux ..	1921	247·8	22	11·8	..	843-1270	1800	13·7	{ 1 3-in., 2 M.	6	48	44
Pierre Marrast (ex-U. 162)		1918	235	21	12·7	2	744-1030	1400	9	{ 1 3-in., 40 mines	18·7	48	95
Jean Roulier (ex-U. 166)		"						2900	10½	{ 1 3-in., 40 mines	18·7	48	44
Halbronn (ex-U. 139)		1918	302·2	30	15·5	2	1841-2516	3300	13·6	2 5·9-in.	6	80	—
Jean Antric (ex-U. 105)								1750	7·7		19·7	443	—
Jean Mignot (ex-U. 108)								2400	16·5	1 4 1-in., 1 M.	6	48	—
Jean Corré (ex-U.B. 155)								1200	8·5	1 4 1-in., 1 M.	19·7	48	81
Carisian (ex-U.B. 99)											5	34	74
Trinité Schillemanns (ex-U.B. 94) .. .		1917	182·5	19	12	..	464-640	1100	12	1 4 1-in., 1 M.	19·7	34	74
René Audry (ex-U. 119) .. .		1917	267·5	24	14	..	1041-1525	760	7·5		4	54	—
Victor Réveillé .. .		1916	193	19·5	16	..	681-877	2400	14·5	{ 1 5·9-in., 1 M.	4	213	—
(ex-U. 79) .. .								1200	7·2	{ 42 mines	19·7	54	—
								1300	10	{ 1 4 1-in., 1 M.	2	40	64
								800	8	{ 36 mines	18·7	40	64

French submarines are divided into two classes. 1st class: All vessels of 850 tons and above in the surface condition, including the U minelayers. 2nd class: All smaller vessels.

\* Mine-laying submarines.

## Germany.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Fuel. Coal Oil.
			Length. (Extreme.)	Beam.	Draught.							
DESTROYERS—												
Hilts .. . . .		1927										
Wolf .. . . .	Wilhelms-haven	1927										
Tiger .. . . .												
Luchs .. . . .		1928	304	28½	8½	2	800	23,000	34	3 4·1-in.	6 115	— 300
Jaguar .. . . .										19·7 in. (T.)		
Leopard .. . . .												
Seeadler .. . . .		1926										
Greif .. . . .	Wilhelms-haven	1926										
Albatros .. . . .		1926	287½	27½	9½	2	800	23,000	33	3 4·1-in.	6 111	— 300
Kondor .. . . .		1926								19·7 in. (T.)		
Falke .. . . .		1926										
Möwe .. . . .		1926										
*G. 11 .. . . .	Germania Works, Kiel	1911										
*G. 10 .. . . .			233†	25	10	2	650	16,000	32	2 4·1-in., 7 M.	2 90	140
*G. 8 .. . . .										19·7 in.		60
*G. 7 .. . . .		1912										
TORPEDO BOATS—												
T. 23 .. . . .	Shichau Elbing Kiel	1913	234·6	24·6	10	2	630	15,700	32	2 4·1-in., 7 M.	2 90	132
T. 196 .. . . .	Vulcan Works, Stettin	1911	243	26	10·5	2	787	18,000	32	2 4·1-in., 2 M.	2 98	160
T. 190 .. . . .		1910								19·7 in.		54
T. 151, 153, 155–8 ..	..	1907–8	237	25½	10·1	2	664	10,900	30	2 3·9-in.	2 97	— 172
										19·7 in.		

Four destroyers are projected; construction was due to commence in 1934.

Five torpedo boats are projected, construction to commence in 1936.

• Classified as torpedo boats in German official lists.

† Length increased during alterations, 1929–30.

## Greece.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Fuel. Coal Oil.
			Length. (Extreme.)	Beam.	Draught.							
DESTROYERS—												
Hydra .. . . .												
Conduriotis .. . . .	Odero, Genoa	1931	308·8	30·3	10·5	..	1230	30,000	40	{ 4 4·7 in., 4 2-pr. A.A.	6	— 80
Spetsai .. . . .			308·8	30·3	11·3	..	1308			{ 21-in. (T.)		
Psara .. . . .												
Thyella .. . . .	Yarrow ..	1906	220	20·6	9·0	2	305	6000	30	2 3-in. 1 2-pr.	2 70	— 80
Sphendoni .. . . .										18-in.		
Niki .. . . .	Stettin											
Aspis .. . . .	(Vulcan)											
*Aetos, *Leon, *Panther, *Ierax ..	Birkenhead	1911	220	20·6	9·0	2	275	6000	30	{ 2 3-in., 4 6-pr.	2 70	— 80
										{ 21-in. (T.)		
TORPEDO BOATS—												
Arethusa .. . . .												
Doris .. . . .	Stettin	1913	147·9	9	4	..	142	2400	25	2 6-pr.	3	— ..
+Aigio .. . . .	(Vulcan)									18-in.		
+Alkyonis .. . . .												
+Pergamos .. . . .	Fiume											
+Proussa .. . . .												
+Kios .. . . .												
+Kyzikos .. . . .	Monfalcone	1914	178·4	18·8	5	..	237	5000	28½	1 11-pr.	..	..
+Kydonia .. . . .												
SUBMARINES—												
Katsonis .. . . .	Schneiders, Harfleur	1926	203½	17·7	12·3	..	567	1300	14	{ 1 4-in., 1 2-pr. A.A.	6	30 ..
Papanicolis .. . . .	Ch. de la Loire, Nantes						760	1000	9·5	{ 21-in.		
Nereus .. . . .	Ch. de la Loire, Nantes	1927										
Proteus .. . . .			226½	18½	12·6	2	689	1500	14	{ 1 4-in., 1 2-pr. A.A.	8	45 ..
Triton .. . . .	Ch. de France, Caen	1928					945	1200	9·5	{ 21-in.		
Glaucus .. . . .												

New programme includes 10 destroyers and a number of submarines. Contracts will be invited from foreign firms willing to undertake construction in Greece. The work will be spread over a number of years.

\* Reconstructed by Messrs. J. S. White &amp; Co., Cowes, 1924–25.

† Surrendered Austrian torpedo-boats employed on police duties.

+ On sale list.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Breadth.	Draught.								Coal. Oil.	
			Feet.	Feet.	Feet.								Tons	
*FLOTILLA LEADERS—														
U. Vivaiidi .. .	Genoa	1929												
A. Usodimare .. .	(Odero)	1929												
L. Tarigo .. .	Genoa	1928												
L. Malocello .. .	(Ansaldo)	1928												
L. Pancaldo .. .	Riva Trigoso	1929												
A. Da Noli .. .	(Cant. Navali)	1929												
E. Pessagno .. .	Ancona	1929												
N. Da Recco .. .	(Cant. Navali)	1929												
N. Zeno .. .		1928												
G. Da Verazzano .. .		1928												
A. Cadamosto .. .	Fiume ..	1929												
A. Pigafetta .. .		1929												
Leone .. .		1923												
Pantera .. .	Ansaldo ..	1924	359·3	34·3	11·5	2	1625	42,000	34	8 4·7-in. (in pairs), 2 3-in. A.A., 60 mines.	6	18-in. (T.)	210	—
Tigre .. .		1924	b.p.											350
Aquila .. .	Pattison ..	1916					1407			4 4·7-in., (in pairs), 2 3-in. A.A., 60 mines.	4	18-in. (D.)	140	—
Falco .. .	Pattison ..	1916					1285	39,800	36·5	3-in. A.A., 60 mines.	3	18-in. (D.)	260	
Premuda .. .		1918	347·8	34	14·2	2	1526	48,000	36	4 5·9-in., (2 2-pr. A.A.)	4	19·7-in. (D.)	150	—
(ex-German V116) .. .										8 4·4-in., 4 2-pr. A.A., 100 mines.	4	18-in. (D.)	720	
Augusto Riboty .. .		1915	331·3	32·2	9·8	2	1382	35,000	35	8 4·4-in., 4 2-pr. A.A., 100 mines.	4	18-in. (D.)	150	—
Carlo Mirabelllo .. .	Ansaldo ..	1914	b.p.											344
DESTROYERS—														
Spica .. .	Partenopei,	1934												
Astore .. .	Naples	1934												
Maestrale .. .	Fiume													
Grecale .. .	Bldg.													
Libeccio .. .	Ancona	1934												
Scirocco .. .	Genoa													
Dardo .. .	Odero, Sestri	1930												
Strale .. .	Pozente													
Freccia .. .	Cant. Navale	1931	311	30	11	..	1206	44,000	38	4 4·7-in., 4 M. A.A.	6	21-in. (T.)	..	oil
Saetta .. .	Seatri Levante	1931												
Folgore .. .	Cantieri													
Lampo .. .	Partenopei,	1931	309	30·5	11	..	1220	44,000	38	4 4·7 in.	6	21-in. (T.)	..	oil
Baleno .. .	Quarnero Yrd.													
Fulmine .. .	Fiume													
Borea .. .														
Zeffiro .. .	Ansaldo,	1927												
Espero .. .	Genoa	1927												
Ostro .. .		1928												
Aquilone .. .	{ Odero, }	1927	311½	30	11	2	1073			4 4·7-in., 32-pr. A.A., 3 M., 52 mines.	6	21-in. (T.)	140	—
Turbine .. .	{ Genos }	1927												
Nembo .. .	Genoa	1927					1092			3 4·7-in., 22-pr. A.A., 2 M., 40 mines.	4	21-in. (T.)	140	—
Euro .. .	Docks Co.	1927												
N. Sauro .. .	Odero	1926												
C. Battisti .. .	Quanaro,	1926												
F. Nullo .. .		1926	295½	30·2	10·5	..	1068	32,000	35	32-pr. A.A., 3 M., 52 mines.	6	21-in. (T.)	140	—
D. Manin .. .	Fiume	1926												340
Francesco Crispi .. .														
Giovanni Nicotera .. .	Naples	1926												
Bettino Ricasoli .. .	(Pattison)	1926	278·6	28·2	10	2	935	28,000	35	22-pr. A.A., 2 M., 40 mines.	2 dbl	2 1-in.	106	—
Quintino Sella .. .		1925												200
Alessandro Poerio .. .	Genoa													
Giuliano Pepe .. .	(Ansaldo)	1914	279	26·3	9·3	2	844	20,000	32	5 4-in., 2 2-pr. A.A.	4	18-in. (D.)	100	—
+Impavido .. .		1913												
+Indomito .. .	Naples	1912												
+Invidioso .. .	(Pattison)	1913	239½	24·0	8·4	2	540	13,500	30	5 4-in., 12-pr. A.A., 1 M., 10 mines.	4	18-in. (D.)	71	—
+Irrequieto .. .		1913												110
+Ardente .. .	Orlando	1912	239½	24·0	8·4	2	560	13,800	30	5 4-in., 12-pr. A.A., 10 mines.	2	18-in. (T.)	71	—
+Giuseppe Sirtori .. .		1916												
+Vicenzio Orsi .. .		1917												
+Francesco Stocco .. .		1916	237½	24	9·0	2	669	15,000	32-33·8	6 4-in., 4 2-pr. A.A., 2 M., 10 mines.	4	18-in. (D.)	100	—
+Giovanni Acerbi .. .		1916												150
+E. Cosenz .. .	Genoa	1918												
+Giacomo Medici .. .	(Odero)	1917												
+G. La Farina .. .		1918	237½	24	9·0	2	635	15,500	31-34	4 4-in., 2 3-in., 2 M., (10 mines.)	4	18-in. (D.)	100	—
+Nicola Fabrizi .. .		1917												
+Angelo Bassini .. .		1917												
+Giacinto Carini .. .		1917												
+G. La Massa .. .		1917												
+Fratelli Cairoli .. .	Naples													
+Antonio Mosto .. .	(Pattison)	1914	236	24	8·8	2	615	13,500	30	5 4-in., 2 2-pr. A.A., 2 M., 28-in. A.A., 24 mines	4	18-in. (D.)	71	—
+Rosolino Pilo .. .														
+Giuseppe Abba .. .	Genoa													
+Ippolito Nievo .. .	(Odero)													
Cesare Rossarol, ex-German B97 .. .	Hamburg	1915	321½	30·6	9·5	2	744	40,000	34	3 4·7-in., 2 8-in. A.A., 24 mines	4	19·7-in. (D.)	114	—
														528

\* Designated scouts in Italian official lists.

† Designated torpedo boats in Italian official lists.

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Name or Number.	Where Built.	Launched.	Dimensions.				Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Standard Displacement						
DESTROYERS—contd.													
*Simone Schiaffino ..		1914	236	24	8·8	2	615	13,500	30	{ 5 4-in., 2 2-pr. A.A. 2 M.	4 18-in.	71	—
*Giuseppe Dezza ..		1914											150
*Giuseppe Missori ..		1915											
*Gen. A. Cantore ..													
*Gen. A. Chinotto ..	Genoa (Odero)	1921	240	24	9·0	2	635	18,000	30	{ 3 4-in., 23-in. A.A. 2 M.	4 18-in. (D.)	100	—
*Gen. A. Papa ..													150
*Gen. A. Cascino ..													
*Gen. M. Prestinari ..													
*Gen. C. Montanari ..													
Audace ( <i>ex-Japanese</i> Kawakaze) .. .	Yarrow ..	1917	287	27·5	8·3	2	628	21,500	34·5	{ 7 4-in., 1 2-pr. A.A. 2 M.	4 18-in. (D.)	111	—
Ardimentoso, <i>ex-German S. 63</i>	Schichau ..	1915	272	27·3	8·6	2	803	24,000	33	{ 3 4-in., 23-in., 24 mines	4 19·7-in. (D.)	98	—
Solferino, Palestro S. Martino, Curtatone	{ Leghorn (Orlando) }	{ 1921 1922 1923 }	{ 269 283½	{ 26·5 28·5	{ 8·6 8·2	{ 2 2	{ 860 966	18,000	32- 33·5	{ 4 4-in., 2 3-in. A.A. 2 M., 24 mines	4 18-in. (D.)	115	—
Confienza, Castelfi- dardo, Calatafimi, Monzambano ..													170
Cortellazzo .. .													
Grado .. .	{ Danubius <i>ex-Austrian</i> }	{ 1917 1913 }	274	25·5	8·2	2	{ 561 594	22,000	32	{ 2 3·9-in., 4 3-in., 6 smaller	4 18-in. (D.)	102	110
Monfalcone .. .													140
Zenson ( <i>ex-Pola</i> ) ..													
TORPEDO BOATS—													
A.S. 56, 57 .. .	Ansaldo ..	{ 1916- 1918 }	139·5	15	5·5	2	{ 133 169	3,400	28-29	2 3-in. A.A.	2	..	..
O.L.T., 74, 75 .. .	Orlando ..												
SUBMARINES—													
Diamante .. .	Taranto ..												
Smeraldo .. .													
Rubino & Topasio ..	Fiume ..												
Zaffiro & Ametista ..	Orlando ..												
Serena, Naiade, Nereide, Aufitrite,													
Galatea, Ondina ..	Monfalcone ..												
Archimede, Galileo, Torricelli, Ferraris ..	Taranto ..	Bldg.	..	..	..	2	{ 880 1,231	3,000 1,300	17·5 8·5	1 3·9-in.	8	..	..
Glaucio, Ontario ..	Monfalcone ..	Bldg.	..	..	..	2	{ 862 1,167	3,000 1,040	17·0 8·5	1 3·9-in.	8	..	..
3 ("Balilla" class)	Spezia ..	Bldg.	..	..	..	2	{ 1,333 1,965	4,400 1,800	17 8·75	1 4·7-in., 1 smaller	8	..	..
Pietro Micca + ..	Taranto ..	Bldg.	..	..	..	..	{ 1,371 1,883	3,200 1,500	16·0 8·5	2 4·7-in., 1 smaller	6	..	..
Squalo, Narvalo, Delfino, Trilceo ..	Cantiere N., Triestino ..	1930	229	19	14·5	..	{ 810 1,077	3,000 1,400	16·5 9	1 4-in.	6	21-in.	64
Argonauta, Fisalia, & Medusa .. .	Cantiere N., Triestino ..	1931											
Jalea & Jantina ..	Odero-Terni ..	200	19·5	13	..	..	599	1,200	14	1 4-in.	6	21-in.	..
Serpente ( <i>ex-Nauti- lus</i> ) & Saipa .. .	Taranto ..	1932					791	800	8·5				
Santorre Santarosa ..													
Ciro Menotti .. .	Ansaldi ..	1929					{ 815 1,078	3,000 1,300					
Fratelli Bandiera ..	Monfalcone ..	1929	230	19	15·5	..	{ 797 1,134	3,000 1,400	17·5	1 4-in.	8	..	..
Luciano Manara ..													
Luigi Settembrini ..													
Ruggiero Settimi ..	Taranto ..	1930											
E. Fieramosca ..	{ Taranto .. (Tosi) ..	1930	277	27	16·8	..	{ 1,340 1,760	6,000 2,000	19 10	1 4·7-in., 1 3·9-in.,	8	21-in.	..
M. Bragadino .. .	Taranto ..	1929											80
F. Corridoni .. .	(Tosi) ..	1930	233	18·6	14	2	{ 802 1,051	1,500 1,000	14 8	1 4-in., 24 mines	4	..	41
Ballila .. .													
A. Sciesa .. .	Spezia ..	1928											
E. Toti .. .	Ansaldi ..	1928	285	25·6	14	..	{ 1,368 1,874	4,400 2,200	18·5 9	1 3·9-in.	6	21-in.	..
D. Millelire .. .		1927											
V. Pisani .. .													
M. Colonna .. .	Montfalcone ..	1927	223	18·7	13·8	..	{ 791 1,040	3,000 1,000	17·5 9	1 4-in., 1 M.	6	21-in.	..
Da. Geneys .. .	Trieste ..	1928											48
G. Bausan .. .													
G. Mameli .. .													
P. Capponi .. .													
T. Speri .. .	Taranto ..	1927	213·3	21·5	13	..	{ 770 994	3,000 1,000	17 9	{ 1 4-in., 1 M.	6	21-in.	..
G. Da. Procida ..													48
L. Mocenigo .. .	Venice ..	1918	211·7	20·3	15·6	..	780	2,600	17	{ 2 3-in., 1 M.	6	18-in.	..
L. Galvani .. .	{ 1919 }						900	1,300	10	{ 2 3-in., 1 M.	6	18-in.	50
G. Nani .. .	Spezia, (F.I.A.T.)	1917	218·0	19·3	14	..	{ 708 909	2,600 1,300	17 10	{ 1 3-in. A.A., 1 M., 18 mines	6	18-in.	60
X 2, 3 .. .	Ansaldi ..	1916	139·9	18	11	..	{ 390 460	660 360	10 6·3	{ 1 3-in. A.A., 1 M., 18 mines	2	18-in.	8
H 1, 2, 3, 4, 6, 8 ..	Vickers ..	1917	150·3	15·8	12	..	{ 336 466	620 480	13 10	{ 1 3-in. A.A., 1 M., H1, 4, and 6 only	4	18-in.	18
F 6, 13, 20 .. .	F.I.A.T. ..	1916	149·6	13·8	10	..	242	670	12·5	1 3-in. A.A.	2	in.	12
N 3, N 4 .. .	Orlando ..						313	250	8				
N 6 .. .	Ansaldi ..	1916	150·5	14	9·9	..	262	650	12·5	{ 1 3-in. A.A., 1 M.	2	18-in.	—
	Taranto ..	1917					{ 349 349	360	8	{ 1 3-in. A.A., 1 M.	2	18-in.	9

## Japan.

Name or Number.	Where Built.	Launched.	Dimensions.					Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal Oil
			Length. (Extreme.)	Beam.	Draught.	Number of Screws.	Displacement.						
			Feet.	Feet.	Feet.	Tons.	Knots.						Tons.
DESTROYERS :													
FIRST CLASS—													
Nurasame .. .	Sasebo ..	Bldg.	336 $\frac{1}{2}$ on W. L.	33·9	8·6	..	..	..	..	5-in. guns	..	..	..
Shigure .. .													
Shiratzuyu .. .													
Hatsushima .. .	Uraga ..												
Ariake .. .	Kawasaki ..												
Yugure .. .	Maizuru ..	1934	338	32·7	8·8	..	1378	37,000	34	5·5-in. guns	9	..	..
Wakaba .. .	Sasebo ..	1932											
Nenoi .. .	Uraga ..	1933											
Hatsuhara .. .	Sasebo ..												
Oborō .. .	Sasebo ..												
Akebono .. .	Fujinagata ..												
Sazanami .. .	Maizuru ..												
Ushio .. .	Uraga ..	1929-											
Akatsuki .. .	Sasebo ..	1932											
Hibiki .. .	Maizuru ..												
Ikazuchi .. .	Uraga ..												
Inazuma .. .	Fujinagata ..												
Sagiri .. .	Uraga ..	1929											
Asagiri .. .	Sasebo ..	1929											
Yugiri .. .	Maizuru ..	1930											
Amagiri .. .	Tokyo ..	1930											
Shikinami .. .	Maizuru ..	1929	368 b.p.	34	10·7	..	1700	40,000	34	6·5-in., 2 M.	9	21-in.	210
Ayanami .. .	Fujinagata ..	1929											
Fubuki .. .	Maizuru ..	1927											
Shirayuki .. .	Yokosuka ..	1928											
Hatsuyuki .. .	Maizuru ..	1928											
*Miyuki .. .	Uraga ..	1928											
Murakumo .. .	Fujinagata ..	1928											
Shinonome .. .	Sasebo ..	—											
Usugumo .. .	Ishikawa-jima (Tokyo)	1927											
Shirakumo .. .	Fujinagata ..	1927											
Isonami .. .	Uraga ..	1927											
Uranami .. .	Sasebo ..	1928											
Minadzuki .. .	Uraga ..	1926											
Fumitsuki .. .	Fujinagata ..	1926											
Nagatsuki .. .	Ishikawa-jima	1926											
Kikudzuki .. .	Maizuru ..	1926											
Mikadzuki .. .	Sasebo ..	1926											
Mochidzuki .. .	Uraga ..	1927	320 b.p.	30	9·8	2	1315	38,500	34	{ 4 4·7-in., ( 2 M. A.A.)	6	21-in.	148
Yudzuki .. .	Fujinagata ..	1927											
Yayoii .. .	Uraga ..	1924, 25											
Udzuki .. .	Ishikawa-jima	1925											
Mut-ukl .. .	Sasebo ..	1924, 25											
Kisaragi .. .	Maizuru ..	1925											
Satsuki .. .	Fujinagata ..	1925											
Oite .. .	Uraga ..	1924, 25											
Hayate .. .	Ishikawa-jima	1925											
Yunagi .. .	Sasebo ..	1924, 25											
Kamikaze .. .	Nagasaki ..	1922	320 b.p.	30	9·6	..	1270	38,500	34	{ 4 4·7-in., ( 2 M. A.A.)	6	21-in.	148
Asakaze .. .													
Harukaze .. .	Maidzura ..	1922-24											
Matsukaze .. .													
Hatakaze .. .													
Asanagi .. .	Fujinagata ..	1924											
Tanikaze .. .	Maizuru ..	336·5	29	9·3	2	1180	34,000	34	{ 3 4·7-in., ( 2 M.)	6	21-in.	128	— 380
Kawakaze .. .	Yokosuka ..												
Sawakaze .. .													
Okikaze, Shimakaze .. .	Nagasaki ..	1916-19											
Nadakaze, Yukaze .. .	Maizuru ..												
Hakaze, Minekaze .. .													
Namikaze, Numakaze .. .	Mitsubishi, Kawasaki ..	1920-22	320 b.p.	29·25	9·5	2	1215	38,500	34	{ 4 4·7-in., ( 2 M. A.A.)	6	21-in.	149
Nomakaze, Nokaze .. .													
Tashikaze, Shokaze .. .													
Hokaze, Yakaze .. .													
Akitake .. .													
Urakaze .. .	Yarrow ..	1915	287·3	27·6	9·5	—	810	22,000	28	{ 1 4·7-in., ( 4 3-in.)	4	21-in.	116
SECOND CLASS—													
Wakatake .. .	Kawasaki, Kobe	1922											
Kuretake .. .													
Fuyo .. .	Fujinagata ..	1922, 23	275 b.p.	26·5	8·3	..	820	21,500	31·5	{ 3 4·7-in., ( 2 M. A.A.)	4	21-in.	110
Karukaya .. .	Ishikawa-jima	1922-23											
Asagao .. .													
Yugao .. .													
Sanaye .. .	Uraga ..	1923	275·0 b.p.	25·3	7·9	2	755	16,000	31·5	{ 3 4·7 in., ( 2 M.)	6	18-in.	109
Yanagi, Momo .. .	Sasebo ..												
Kashi, Hinoki .. .	Maidzuru ..	1916-18											

3 destroyers (Nos. 68-70) of 1378 tons are projected. To be built up to 1936-7.

\* Miyuki sunk 29th June, 1934.

## Japan—continued.

Name or Number.	Where Built.	Launched.	Dimensions.				Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement	Fuel Coal Oil	
			Length (extreme),	Beam,	Draught,	Number of Screws.								
DESTROYERS—contd.														
Second class—contd.														
Kaya .. . . .	Yokosuka ..													
Nashii, Kaki, Take .. . . .	Kawasaki ..													
Kuri .. . . . .	Kure ..	1917-19	275·5 b.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M. A.A. }	4 21-in.	80	— 290	
Nire, Tsuga .. . . .	Ishikawa-jima ..													
Hagi .. . . .	Uraga ..													
Susuki, Yomogi .. . . .	Ishikawa-jima ..													
Sumire .. . . .	Uraga ..	1920-	275·5 p.p.	26	8	2	770	21,500	31·5	{ 3 4·7 in., 2 M., A.A. }	4 21-in.	80	— 290	
Hi-hi, Hami .. . . .	Fujinagata ..	1922												
Tade, Fuji .. . . .	Kawasaki ..													
Aoi, Kiku .. . . .														
Tsuta, Ashi .. . . .														
TORPEDO BOATS—														
*Chidori .. . . .	Maizuru ..	1933												
Manazuru .. . . .	Osaka ..	254	23	6	..		about 627	7000	26	3 5-in.	4	..	..	
Tomazuru .. . . .	Maizuru ..	1934												
Hatsukari .. . . .	Fujinagato ..													
SUBMARINES—														
Ro 34 .. . . .	Bldg. Com- pleted 1933													
168 .. . . . .	Kure ..						Surf.							
169 .. . . . .	Kobe ..						Sub							
170 .. . . . .	Sasebo ..	1934	331	27	13	..	1400							
171 .. . . . .	Kawasaki ..						—							
172 and 173 .. . . .	Bldg.						—							
16 .. . . . .	Kawasaki ..	Bldg.		..	..	..	700	..	..	..	..	..	..	
16 .. . . . .	Kawasaki ..						—	—	—	..	..	..	..	
16 .. . . . .	Kawasaki ..	1932	320	30	15·7	..	1900	..	..	..	..	..	..	
165 .. . . . .	Kure ..						—	—	—					
166 .. . . . .	Sasebo ..	1931	321	26·6	15·9	..	1955	6000	17	2 5 in.	6	60	..	
167 .. . . . .	Kobe ..						—	—	—					
168 .. . . . .	Mitsubishi ..	1929					1638	6000	19	1 4-in.	6	..	..	
162 .. . . . .	Kobe ..	1928	320	25·7	16	..	2100	1800	9	1 M.	21-in.			
164 .. . . . .	Kure ..	1929					1955	6800	17	1 4·7 in.	6	56	— 255	
14 .. . . . .	Kawasaki ..	1929	320	30·2	15·7	..	2480	1800	9	{ 2 5·5 in., 1 M. }	6	61	— 520	
11, 12, 13 .. . . .	Kawasaki ..	1926					—	—	—					
+121 .. . . . .	Kawasaki ..	1927					—	—	—					
+122 .. . . . .	Kawasaki ..	1928	279	24·6	14	..	1142	2400	14	1 5·5-in.	4	45	..	
+123 .. . . . .	Kawasaki ..	1928					—	—	—					
+124 .. . . . .	Kawasaki ..	1928					1470	1200	9·5	1 5·5-in.	21-in.			
153 .. . . . .	Kure ..	1927					—	—	—					
155 .. . . . .	Kure ..	1927					—	—	—					
156 .. . . . .	Kure ..	1929					—	—	—					
154 .. . . . .	Sasebo ..	1927					—	—	—					
163 .. . . . .	Sasebo ..	1928	331	26	16	..	1635	6000	21	1 4·7-in.	8	56	— 255	
160 .. . . . .	Sasebo ..	1929					—	—	—					
159 .. . . . .	Yokosuka ..	1929					2100	1800	7·9	1 3-in.	21-in.			
158 .. . . . .	Yokosuka ..	1928					—	—	—					
157 .. . . . .	Kure ..	1929					—	—	—					
Ro. 31 .. . . .	Mitsubishi ..	1927	243	20	12·4	..	655	1200	13	1 3-in.	6	43	— 75	
Ro. 65 .. . . .	Mitsubishi ..	1926					1000	1200	10	1 3-in.				
Ro. 66 .. . . .	Mitsubishi ..	1927					—	—	—					
Ro. 67 .. . . .	Mitsubishi ..	1927					—	—	—					
Ro. 68 .. . . .	Mitsubishi ..	1925	250	24·2	12·4	..	988	2400	16	1 3-in.	6	47	— 75	
Ro. 64 .. . . .	Mitsubishi ..	1925					1300	1800	10	1 M.				
Ro. 63, 62, 61 .. . .	Mitsubishi ..	1924					—	—	—					
Ro. 60 .. . . .	Mitsubishi ..	1923					—	—	—					
I. 51 .. . . .	Kure ..	1924	300	28·7	16	..	1390	6000	19	1 4·7-in.	8	..	—	
I. 52 .. . . .	Kure ..	1925	330	25	16·8	..	2000	1800	7·9	1 4·7-in.	4	43	— 190	
Ro. 32, 30 .. . .	Kawasaki ..	1924	243	20	12·4	..	655	1200	13	1 4-in.	75			
Ro. 29 .. . . .	Kawasaki ..	1923					1000	1200	10	1 3-in.				
Ro. 28 .. . . .	Sasebo ..	1923	230	b.p.	20·1	12	..	746	2600	16	1 3-pr.	4	..	
Ro. 27 .. . . .	Yokosuka ..	1924					1000	1200	10	1 3-pr.	21-in.			
Ro. 26 .. . . .	Sasebo ..	1922					—	—	—					
Ro. 59 .. . . .	..	1923	260	23·5	13	..	889	2400	17	1 3-in.	4	65	—	
Ro. 58, 57 .. . . .	..	1922					1082	1200	10·5	1 3-pr.	21-in.			
Ro. 25, 19, 18, 17 .. . .	Sasebo, Kure ..	1921					—	—	—					
Ro. 24 .. . . .	Sasebo ..	1920					—	—	—					
Ro. 23 .. . . .	Yokosuka ..	1923	230	20	12·2	..	735	2600	17	1 3-in. H.A.	6	43	—	
22, 21, 20, 16 .. . .	Yokosuka, Kure ..	1922					986	1200	10	1 3-pr.	18-in.			
Ro. 56, 55 .. . . .	Mitsubishi ..	1922	231	25	23·5	13	893	2400	17	1 3-in. H.A.	6	65	—	
54, 53 .. . . .	Mitsubishi ..	1921					1042	1200	10·5	1 3-pr.	18-in.			
51 .. . . .	Mitsubishi ..	1920					—	—	—					
Ro. 15, 14 .. . . .	Kure ..	1921	230	20	12·3	..	736	2600	17	1 3-in.	6	48	—	
	Kure ..	1920					986	1200	10	1 3-pr.	18-in.			

\* Chidori capsized 28th March, 1934, and designs are being examined. These vessels will probably be modified.

† Fitted for minelaying.

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## Netherlands.

Name or Number.	Where built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-power.	Maximum speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length. (Extreme.)	Beam.	Draught.								Coal. Oll.	
DESTROYERS—														
*Banckert ..	Burgerhout	1929												
*Van Nes ..	Rotterdam	1930	321·5	31	9·8	2	1316	31,000	34	4 4·7-in., 1 3-in. A.A., 4 1-pr., 4 M.	6 21"	126	— 330	
*Van Galen ..	Fijenoord	1928								1 seaplane				
*Witte de With ..	Rotterdam	1928								24 mines				
De Ruyter ..	Flushing	1926								4 4·7-in.				
*Evertsen ..	Flushing	1926								2 3-in. A.A.				
*Piet Hein ..	Rotterdam	1927								24 mines				
*Kortenaer ..	Rotterdam	1927								1 seaplane				
1ST CLASS TORPEDO BOATS—														
†Zeeslang ..	Flushing	1907									2	20	20	
†Krokodil ..	Flushing	1906	130	13·8	6·9	1	87-90	{ 1560- 1580	24	2 1-prs.	17·7"	20	—	
†Draak ..	Flushing	1906												
G 13, 15 and 16 ..	Scheldt	1913-								3	27	40	—	
	Fijenoord	1914	162·5	17·3	9·0	..	150	2,600	25	2 3-in.	17·7"	—		
Z 1-4 ..	Amsterdam	1916-	201	20·4	6	2	277	5,500	27	2 3-in., 2 M.	4 17·7"	39	61 8	
Z 5-8 ..	Scheldt	1916-												
	Fijenoord	1915	192	19·8	5·5	2	264	5,500	27	2 3-in., 2 M.	4 17·7"	39	70	
‡G 12 and 2 ..	..	1903-7	..	..	..	..	112	..	..	..	3 17·7"	..	7	
SUBMARINES—														
K XIV ..	Rotterdam	1932-3	242	21·5	13·3	..	810	3000	17	1 3·5-in., 2 2-pr.	6	..	..	
K XV ..	Rotterdam						1,000	1000	9					
K XVI ..	Rotterdam						825							
K XVII ..	Fijenoord						1,020							
K XVIII ..	Fijenoord													
O 12 ..	De Schelde	1931	19·9	18·7	11·5	..	560	1,900	15	2 1·5-in. A.A.	5 21"	..	..	
O 13 ..	De Schelde						700	600	8					
O 14 ..	De Schelde													
O 15 ..	De Schelde													
†K XIII ..	Fijenoord	1924	218 8	20·2	12·2	..	660	2,400	15	1 22-pr., 1 maxim	6	31	— 45	
†K XII ..	Fijenoord						810	—	8					
†K XI ..	Fijenoord													
O 11 ..	Fijenoord						506	900	12	1 22-pr. A.A., 1 maxim	5 21"	29	— 21	
O 10 ..	Amsterdam	1925	179 1	18·7	11 1	..	627	—	9					
O 9 ..	Flushing													
O 8 ..	(ex-British H6)	..	1914	150·3	15·8	12·3	..	364	480	13	1 maxim	4 17·7"	26	— 18
M 1 ..	Hamburg	1915	111 1	10·3	9	..	434	320	8·5					
(ex-German UC 8)							157	80	7 1	1 4-pr. 12 mines	—	16	— 2 1	
O 7 ..	Fijenoord	1916	112	12·8	9·5	..	177	350	11·5	1 maxim	3 17·7"	12	— 5·4	
O 6 ..	De Schelde	1916	115·9	12·8	9·5	..	206	185	8·5					
O 5 ..	De Schelde	1913	105 3	10·2	9·5	..	187	350	11·5					
O 4 ..	De Schelde	1913					226	185	8·5					
O 3 ..	De Schelde	1912					129	300	11	1 maxim	2 17·7"	10	— 3·6	
†K X ..		1923						147	170	8·5				
†K IX ..	De Schelde	1922	212	18·3	11·9	..	560	1,550	15	1 22-pr. 1 maxim	4 17·7"	29	— 45	
†K VIII ..		1922					690	630	8					
†K VII ..	Fijenoord	1921	177·2	16·8	12·5	..	550	1,200	15	1 3-in., 1 maxim	6 17·7"	29	— 76	
†K VI ..	Fijenoord	1920					630	600	8					
†K V ..		1919												
†K IV ..	De Schelde	1920	211·3	18·3	11·5	..	560	1,200	15	1 3-in., 1 maxim	6 17·7"	29	— 45	
†K III ..	De Schelde	1919					700	1,800	8					
†K II ..	Fijenoord	1919	172·3	16·8	12·5	..	550	1,800	15	1 3-in., 1 maxim	6 17·7"	29	— 76	
							600	600	8					

Two flotilla leaders (2,500 tons, eight 4·7" guns), are projected but no money voted. Four destroyers, Nos. IX-XII are projected but no money voted. Eight submarines, O 16 and O 17, K XIX, K XX, K XXI, K XXII, K XXXIII, K XXXIV, are projected but no money voted.

\* Dutch East Indian Fleet.

† Indian Military Marine.

‡ For harbour service only.

§ To be renamed Van Gendt.

## Norway.

Name or Number.	Where Built.	Launched.	Dimensions.				Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme)	Feet.	Feet.	Draught.								
DESTROYERS— • Draug, Troll, Garm	Horten ..	1908-13	Feet. 236	Feet. 23·5	Feet. 8·8		2	Tons. 540	Knots. 27·0	6 3-in. Draug has 6 4·7-in. in addition	3 18-in.	71	95 6	
FORPETO BOATS: FIRST CLASS— Snogg, Stegg, Trygg	Horten ..	{ 1919- 1920 }	173·9	18	5·4		2	250	2,500	25	2 3-in.	4	81	30
Hval* .. ..	Kilbing ..	{ 1896- 1900 }	180·0	16·0	6·0		1	100	1,100	21	2 M.	2	19	17
Storm, Brand ..	Horten ..	1901	186·4	15·0	6·0		1	140	1,150	21·8	2 M.	2	19	17
Laks, Sild, Sael, Skrei	Horten ..													
SECOND CLASS— (Kjek, Hvas, Kvlik.)														
† Blink, Hauk, Falk	Fredrikstad ..	1898	114·5	14·5	6·0		1	73	650-750	19-20	2 M.		14	11
Lyn .. ..	Horten ..	1903	133	14·5	6·5		1	100	1,600	25	2 3-pr.		18	16
Skarv, Teist .. ..	Horten ..	1906-7	{ 133	14·5	6·5		1	100	1,600	25	2 3-pr.	2	18	16
Lom, Jo, Grib .. ..	Horten ..		117	14·5	5·7		1	72	1,100	23	2 M.		16	15
Ravn, Orn .. ..	Horten ..	1903	113	14·5	5·7		1	73	850	23	2 M.		16	15
Kjell .. .. ..	Horten ..	1912	135	14·0	6·4		1	100	1,800	25	2 3-pr.		19	15
SUBMARINES—														
A 2, 3, 4 .. ..	Germania	1909 to 1913	{ 133·2	15·7	8·9		2	{ 246 332	{ 900 380	{ 14 7			3	17
B 1, 2 .. .. ..	Horten ..	1922						413	900	14·5			4	12·8
B 3, 4 .. .. ..	Horten ..	1923-24	167·3	17·5	10·5		2	645	640	10	1 12-pr.	18°	23	21
B 5, 6 .. .. ..	Horten ..	1929												

3 destroyers (1000 tons, 32 knots, 3 4·7-in. guns), 6 torpedo boats (250 tons), and 10 submarines (500 tons), projected.

\* These vessels are to be modernised.

† Employed as patrol ships.

## Soviet Union.

Some of the details given below are uncertain.

Name or Number.	Where Built.	Launched.	Dimensions.				Number of Screws.	Displacement.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme)	Feet.	Feet.	Draught.								
DESTROYERS— Two in number ..														
Felix Dzerzhinski ..	Ship & Eng. Co., Niko- laev	Bldg. ..	303·5	29·5	10·5		..	..	..	..	4 4-in., 2 7-pr., 4 M., can carry 80 mines (T.)	12	..	..
Petrovitski ..		1917						1326	29,000	33		18°	120	390
Nesamovit ..														
Shaumyan ..														
Karl Marx .. ..		Revel ..	344·5	31·3	9·7		..	1350	32,700	35	5 4-in., 1 3-in. A.A., carries mines (T.)	110	—	400
Kalinin .. ..			321·5	30·5	9·25		..	1610	32,000	35			110	—
Uritsky .. ..														
Volodarski .. ..														
Rykov .. ..		1914												
Engels .. ..														
Stalin .. ..		Leningrad ..	314·75	30·5	9·75		..	1260	30,000	35	4 4-in., 1 3-in. A.A., 2 M., 80 mines (T.)	9	18°	400
Artem .. ..														
Volkov .. ..														
Lenin .. ..														
Bezpokolni* ..														
Gnyevni* ..														
Derski* .. ..	Nikolaev ..	1913-14	307·7	29·5	9		..	1088	25,500	34	3 4-in., 2 3-pr., 4 M. (D.)	10	140	260
Pospyshni* ..														
Puukti* .. ..	Leningrad ..	1913-14	321·5	30·5	9·8		..	1100	23,000	34	3 4-in., 2 3-pr., 4 M., 80 mines (D.)	10	18°	120
Frunze .. .. ..	Leningrad ..	1914	336	31·1	9·8		..	1100	23,000	34	4 4-in., 1 3-in., 4 M. (D.)	6	120	351

\* Under French protection at Bizerta.

## Soviet Union—continued.

Name or Number.	Where Built.	Date of Completion.	Dimensions.			Number of Screws.	Displacement, Surf./Sub.	Horse-Power.	Designed Speed.	Armament.	Torpedo Tubes.	Fuel Coal Oil	Complement.	Tons.	
			Length. (Extreme.)	Beam.	Draught.										
SUBMARINES—															
B4 and 5 .. .															
Revolutioner .. .	Nikolaiev ..	Bldg.	279	23	16½	..	1100	1500	16	13-in. 11-pr.	6	..	..	..	
Yakobinets .. .								—	10						
Spartakovets .. .	Sevastopol														
Dekabrist .. .															
Narodvoletz .. .															
Politrabotnik (ex-Ag 26) .. .		1931	279	23	16½	..	1000	1500	16	13-in.	6	..	..	..	
Marxist (ex-Ag 25) .. .		1924	150½	15½	5½	..	255	480	10	13-in.	6	..	..	..	
Kommunist (ex-Ag 24) .. .		1922	150½	15½	15½	..	467	320	11	16-pr.	4	..	..	..	
Shakter (ex-Ag 23), Ag 22* .. .		1922	150½	15½	15½	..	375	480	13	16-pr.	18"	..	..	..	
Proletary .. .		1920	..	..	..	..	467	320	11	16-pr.	18"	..	..	..	
Rabotchky .. .		1916	223	14·5	12·5						14-in., 2 M.	6	..	..	17
Tyulen* .. .		1915									14-in., 2 M.	6	..	..	17
Politruk .. .		1913	220	14·5	12·7						14-in., 2 M.	6	..	..	17
Utko* .. .		1916									14-in., 2 M.	6	..	..	17
Burysevestnik* .. .		1918	223	14·5	12·5		650	500	10	2 11-pr., 1 1-pr., 1 M.	4	52	..	..	..
Batrak .. .		1917					784	900	9	42 mines	4	..	..	..	40
Krasnoarmeets .. .		1917						900	9						40
Komissar .. .		1916						2640	16						
Bolshevik .. .		1916							9						
Komunar (ex-Tigr) .. .		1916							9						
Tovaristch .. .		1916	223	14·5	12·6			500	10	2 6-pr., 1 1-pr., 1 M.	4	33	..	..	..
Krasnoflotets .. .		1916						900	9						40
Bedryak .. .		1916							9						
L55 (ex-British, raised from Baltic) .. .		230	23·5	13·2	..		900	2400	17·5	2 4-in. guns	6	..	..	..	78
b.p.							1150	1600	10·5						

In addition to the above about four other submarines are understood to be building or authorised. \* Under French protection. There are about thirty-five destroyers and torpedo-boats completed from 1895 to 1912 of very little if any fighting value. Many of the above vessels are known to be practically useless until very extensively repaired and refitted.

## Spain.

Name or Number.	Where Built.	Launched.	Dimensions.			Number of Screws.	Displacement.	Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Coal Oil	Tons.
			Length. (Extreme.)	Beam.	Draught.									
FLOTILLA LEADERS—														
Gravina .. .														
Esc: no .. .														
Ciscar .. .		1934	..	..	..	..	..	..	..	..	..	..	..	..
Jorg-Juan .. .														
Ulloa .. .														
Almirante Valdés .. .														
" Antequera .. .	Cartagena ..	1930												
" Miranda .. .		1930												
Churruca .. .		1931												
Alcalá Galiano .. .		1931	331½	31·7	10·5	2	1,650	42,000	36	{ 5 4·7-in. 13-in. A.A. 14 M. } (T.)	6	21-in.	..	540
Lepanto .. .		1928												
Almirante Ferrandiz .. .		1928												
José Luis Díez .. .	Cartagena ..	1928												
Sanchez Barcaiztegui .. .	Cartagena ..	1926												
DESTROYERS—														
Alejido .. .														
Velasco .. .	Cartagena ..	1922	283	27	9	2	1,145	33,000	34	{ 3 4-in., 2 2-pr. A.A. }	4	21-in. (D.)	70	265
Juan Lazaga .. .		1923												
Villamil (Minelayer) .. .	Cartagena ..	1913	221½	22½	7	..	539	6,250	28	5 6-pr.	4	18-in.	70	80
TORPEDO BOATS—														
12 boats .. .	Cartagena ..	1913	164	16·5	4·9	3	187	3,750	26	3 3-pr.	3	18-in.	31	33
D1 .. .		1922												
C 2-6 .. .														
Isaac Peral (ex-C 1) .. .	Cartagena ..	1928	240	20·8	13·5	..	900	2000	16	1 4-in., 1 3-in. A.A.	6	21-in.	..	..
B 1-6 .. .	Cartagena ..	1921-24	210	18·9	11·25	..	560	1400	16	..	4	18-in.	28	66
A1 .. .														

11 submarines are authorised (1928 programme).

Two repeat D1' submarines are included in new construction programme to be laid down at Cartagena.

## Sweden.

Name or Number.	Where Built.	Launched.	Dimensions.					Horse-Power.	Maximum Trial Speed.	Armament.	Torpedo Tubes.	Fuel. Coal Oil					
						Number of Screws.	Displacement.										
			Length. (Extreme.)	Beam.	Draught.												
DESTROYERS—			Feet.	Feet.	Feet.		Tons.	Knots.									
Klas Horn .. .	Malmo	1931	303·2	29·2	10·5	..	881	24,000— 26,000	35	{ 3 4·7-in., 2 2-prs. A.A., 2 M.	2 trpl. 21°	125	— 150				
Klas Uggla .. .	Karlskrona } }																
Ehrensköld .. .	Göteborg	1926															
Nordenskjöld .. .	Malmö } }																
Magne .. . .	Thornycroft	1905	216	20·8	9	2	354	8,000	30	6 6-prs.	2	..	80				
Wale .. . .	Malmo ..	1906	216	20·8	9	2	354	8,000	30	2 3-in., 4 6- pr.s.	18°	..	—				
Ragnar† .. . .	Malmo ..	1909															
Sigurd .. . .	Göthenburg	1909															
Vidar .. . .	Malmo ..	1909	216	20·8	9	2	354	{ 8,000- 9,000 }	30·0	{ 4 3-in., 2 M. }	4 18°	67	80 3				
Hugin .. . .	Göthenburg	1909															
Munin .. . .	Malmo ..	1910															
Wrangel † .. . .	Malmo ..	1910															
Wachtmeister .. .	Gothenborg	1917	232·8	22	9·2	2	458	11,000	34·0	4 3-in., 2 M.	6 18°	72	107 6				
* TORPEDO-BOATS—																	
1st Class—																	
Castor, Pollux‡ ..	{ Normand & Carlskrona }	1908															
Vega‡ .. . .	Carlskrona ..	1909															
Vesta‡ .. . .																	
Spica, Astrea, Iris, Thetis .. . .	{ Bergsund and Gothenburg }	1909	128	14·5	8·5	1	103	2,000	25	2 6-prs. (except Castor and Pollux 2 1-prs.)	2 18°	18	20				
Altair .. . .																	
Antares .. . .																	
Argo‡ .. . .	Stockholm ..	1908															
Arcturus‡ .. . .																	
Perseus, Polaris ..	Bergsund ..	1910-															
Regulus, Rigel ..	Stockholm ..	1915															
SUBMARINES—																	
1st Class—																	
Ulven .. . .	Naval Yard,	1930															
Draken .. . .	Karlskrona	1926	217	21	10·8	..	700	2800	16	1 4-in., 1 M.	4 20-in.	32	— 40				
Gripen .. . .		1928					850	—	9								
Bavern .. . .																	
Illern .. . .	Naval Yard,	1921	187	19·4	9·2	..	500	2800	15	1 3-in., 1 M.	4 18°	..	— 33				
Uttarn .. . .	Karlskrona }						650	—	9								
Svärdfisken .. . .																	
Tumlaren .. . .	Kockum Co.,	1914	137·7	12·5	9·8	..	300	800	15	1 6-pr.	2 18°	..	— 8				
Sälén .. . .	Malmo ..						—	—	9								
Valrossen .. . .	Kockum Co.,	1920	177·2	16·2	11·2	..	450	—	..	1 3-in., 1 M.	4 18°	..	— 23				
Hajen .. . .	Malmo ..						580	..	..								
Minelaying Sub.—																	
Valen .. . .	..	1925	187·2	23·2	9·4	..	500	..	..	1 3-in., 1 M.	4 18°	..	— 34				
2nd Class—																	
Aborre .. . .	Karlskrona	1914-15	101·7	11·7	10·2	..	173	..	..	..	2 18°	..	— 6·5				
Braxen .. . .	D.Y. . .		88·6	11·7	10·2	..	133	..	..	..	1 18°	..	— 4·0				
Laxen .. . .											*						

† Fitted for mine-laying.

\* Also six small 2nd class torpedo-boats, Nos. 5-9, 14 (60 tons, 20 knots, built 1907-1908), and two motor torpedo-boats, Nos. 3 and 4. Two minelaying submarines B 1 and B 2, 502 tons, are building. Another type B, the Springaran, is to be laid down.

‡ Torpedo-boats marked ‡ have one 18-inch tube only.

A 39-knot destroyer has been ordered from Gota Works, Göteborg and a sister ship is to be built at Karlskrona.

## United States.

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel Oil.
			Length, (Extreme.)	Beam.	Draught.								
DESTROYERS—													
Porter .. .	N.Y.S. Co., Camden		Feet.	Feet.	Feet.		Tons.		Knots.				Tons
Selfridge .. .			372	32½	10½	..	1850	..	..	5-in. guns	..	..	..
McDougal .. .													
Winslow .. .	Bethlehem S.B. Co., Quincy												
Phelps .. .													
Clark .. .													
Moffett .. .													
Balch .. .													
Mahan .. .	United D.D. Inc., N.Y.												
Cummings .. .	Bath I.W. Co.	Bldg. est. 1936											
Drayton .. .	Federal S.B. & D.D. Co.												
Lamson .. .													
Flusser .. .													
Reid .. .													
Case .. .	Navy Yard, Boston		334 on W.L.	34½	9½	..	1500	..	..	5-in. guns	..	..	..
Conyngham .. .	Navy Yard, Philadelphia												
Cassin .. .	Navy Yard, Norfolk												
Shaw .. .	Navy Yard, Puget Sound												
Tucker .. .	Navy Yard, Mare Is.												
Downes .. .	Navy Yard, N.Y.												
Cushing .. .	Navy Yard, Bath, I.W. Co.	Bldg. est. 1935											
Perkins .. .	Navy Yard, Philadelphia												
Smith .. .	Navy Yard, Bethlehem S.B. Co.												
Preston .. .	Navy Yard, Bath, I.W. Co.												
Dale .. .	Navy Yard, Bath, I.W. Co.												
Monaghan .. .	Navy Yard, Bath, I.W. Co.												
Aylwin .. .	Navy Yard, Bath, I.W. Co.												
Farragut .. .	Navy Yard, Bath, I.W. Co.	1934											
Dewey .. .	Navy Yard, Bath, I.W. Co.												
Hull .. .	Navy Yard, Bath, I.W. Co.	1934											
MacDonough .. .	Navy Yard, Bath, I.W. Co.												
Worden .. .	Navy Yard, Bath, I.W. Co.												
Pruitt .. .	Bath, I.W.	1920											
Sicard .. .	Bath, I.W.	1920											
Preble .. .	Bath, I.W.	1920											
William B. Preston .. .	Norfolk, N.W.	1920											
Noa .. .	Norfolk, N.W.	1921											
Hulbert .. .	Norfolk, N.W.	1920											
Decatur .. .	Norfolk, N.W.	1922											
Perry .. .	Navy Yard, Mare Is.	1922											
Trever .. .	Navy Yard, Mare Is.	1922											
Wasmuth .. .	Navy Yard, Mare Is.	1921											
Zane .. .	Navy Yard, Mare Is.	1921											
Litchfield .. .	Navy Yard, Mare Is.	1920											
Marcus .. .	Navy Yard, Mare Is.	1921											
Sloat .. .	Navy Yard, Mare Is.	1920											
Meade .. .													
Swasey .. .													
Tingeys .. .													
Morris .. .													
Thornton .. .	Bethlehem S.B. Co., Squantum	1919	314·4	31	9·	..	1,190		35	4 4-in., 1 3-in. A.A. (Kane, Fox, Brooks, and Hatfield have 4 5-in. guns.)	4 triple 21-in.	122	375
Bailey .. .													
Shubrick .. .													
Ballard .. .													
Greene .. .													
Edwards .. .													
McLanahan .. .													
Laub .. .													
Gillis .. .													
Turner .. .													
Aulick .. .													
Welles .. .													
Bancroft .. .													
Osmond In-gram .. .	Bethlehem S.B. Co., Quincy	1919											
Rodgers .. .													
McCalla .. .													
McCook .. .													
Belknap .. .													

The 1933-1934 building programme consists of 2 heavy destroyers (1850 tons, estimated cost £789,000 each) by the Federal Shipbuilding and Dry Dock Co., Kearney, and twelve 1500-ton destroyers to be built as follows — 2 by the Bethlehem Shipping Corp., Quincy, estimated cost £759,000 each, 2 by the United Shipbuilding and Dry Dock Co. for £686,000 each, 1 at Mare Is. Navy Yard, 2 at Boston Navy Yard, 2 at Puget Sound Navy Yard, and 3 at Norfolk Navy Yard.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Standard Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length. (Extreme.)	Beam.	Draught.								Oil.
DESTROYERS— <i>continued.</i>													Tons.
Lawrence ..		1921											
Hopkins ..		1921											
Barry ..		1920											
Goff ..		1921											
Bainbridge ..		1921											
Reuben James ..													
Williamson ..													
Sands ..													
King ..													
Childs ..													
Sturtevant ..													
Overton ..													
James K. Paulding ..													
McFarland ..													
Humphreys ..													
Kane ..													
Fox ..													
Gilmer ..													
Brooks ..													
Hatfield ..													
Paul Jones ..													
Truxton ..													
John D. Ford ..													
Pillsbury ..													
Peary ..													
Pope ..													
Stewart ..													
McCormick ..													
Bulmer ..													
Simpson ..													
MacLeish ..													
Edsall ..													
Parrott ..													
Whipple ..													
J. D. Edwards ..													
Borie ..													
Tracy ..													
Barker ..													
Smith Thompson ..													
Alden ..													
Broome ..													
Long ..													
Hovey ..													
Southard ..													
Chandler ..													
Dallas ..													
*Herndon ..													
Branch ..													
*George E. Badger ..													
*Welborn C. Wood ..	Newport News S.B. Co.	1921											
*Hunt ..		1920											
*Abel P. Upshur ..		1920											
Mason ..													
Satterlee ..													
Goldsborough ..													
Dahlgren ..													
Clemson ..													
Bagley ..													
Abbot ..													
Haraden ..													
Thomas ..													
Hopewell ..													
Stansbury ..													
Howard ..													
Hogan ..													
O'Bannon ..													
Renshaw ..													
Mackenzie ..													
Kalk ..													
Foot ..													
Maddox ..													
Cowell ..													
Bush ..													
Meredith ..													
Crosby ..													
Walker ..													
Thatcher ..													
Palmer ..													
	Union I.W.												
	For River S.B. Co.	1919	314·4	31	9·8	..	1,060	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286
		1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	288

\* Operated by the U.S. Coast Guard.

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United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.				Number of Screws.	Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel.
			Length (Extreme.)	Beam.	Draught.	Tons.								Oil.
DESTROYERS— <i>continued.</i>														Tons.
Herbert ..	N.Y. S.B. Co.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Schenck ..														
Leary ..														
Dickerson ..														
J. Fred Talbot ..														
Cole ..														
Ellis ..														
Bernadou ..														
Dupont ..														
Biddle ..														
Blakeley ..														
Barney ..	Cramp, Phil.	1918	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Breckenridge ..														
Roper ..														
Elliot ..														
Greer ..														
Upshur ..														
Yarnall ..														
Tarbell ..														
Hamilton ..	Mare Island, N.Y.	1919	314·4	31	9·5	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Claxton ..														
Ward ..														
Kennison ..														
Kilty ..														
+Boggs ..														
Tillman ..														
Crowninshield ..														
Hale ..	Bath I.W.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Aaron Ward ..														
Buchanan ..														
Jacob Jones ..														
Babbitt ..	New York S.B. Co.	1919	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Twiggs ..														
Badger ..														
Tattnall ..														
Radford ..	Newport News S. Co.	1919	314·4	31	9·8	..	{1060 {1090}	25,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Lamberton ..														
Lea ..														
Dorsey ..														
Dent ..														
Waters ..	Cramp, Pa.	1918	314·4	31	9·8	..	1,090	26,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Talbot ..														
Rathburne ..														
Crane ..														
Williams ..														
Chew ..	Union Plant.	1919	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283	
Mugford ..														
Champlin ..														
Schley ..														
Bell ..	Fore River S.B. Co.	1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283	
Taylor ..	Mare Island, N.Y.	1918	314·4	31	9·8	..	1,090	{27,000 {24,200}	35	4 4-in., 1 3 in. A.A.	4 triple 21-in.	122	286	
Fairfax ..														
Gridley ..														
Harding ..														
McKean ..														
Ringgold ..	Union I.W.	1919	314·4	31	9·9	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	286	
Robinson ..														
McKee ..														
Stevens ..														
Colhoun ..														
Dyer ..														
Stringham ..	Fore River S.B. Co.	1918	314·4	31	9·8	..	1,060	27,000	35	4 4-in., 1 3-in. A.A.	4 triple 21-in.	122	283	
Gregory ..														
Sigourney ..														
Kimberly ..														
Little ..														
Evans ..														
Philip ..	Bath I.W.	1917	314·4	31	9·7	..	1,090	{27,000 {24,200}	35	(4 4-in., (1 3-in. A.A.	4 triple 21-in.	122	286	
Wickes ..														
Manley ..														
Stockton ..	Cramp Pa.	1917							18,500	30	(5 4-in., (1 3-in. A.A.			
Conner ..		1918												
Gwin ..	Seattle D.D. Co.	1920	315·5	30·7	9·5	..	1020	18,750	30	(4 4-in., (1 3-in. A.A.	4 triple 21-in.	122	260	
Craven ..	Norfolk, N.Y.	1918							20,000	32	(4 4-in., (1 3-in. A.A.			

† Equipped as targets, wireless controlled.

In addition to the above there are 21 obsolete destroyers of the Flusser Class, completed 1910–1912. Their displacement is 650 tons, 29·5 knots, 10,520–12,000 H.P., 3 to 5 3-in. A.A. guns, and 3 double torpedo tubes. Their names are Mayrant, Henley, Jarvis, Beale, Fanning, Jenkins, Jouett, No. 36 ex-Patterson, No. 32 ex-Walke, No. 32 ex-Monaghan, No. 35 ex-Ammen, Trippé, Warrington, Burrows, McCall, Sterrett, No. 26 ex-Perkins, No. 23 ex-Drayton, Terry, Paulding, Roe. 8 of these are on the disposal list.

Destroyers Hazelwood, Stoddert and Sinclair are employed as target ships.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.				Displacement.	Horse-Power.	Maximum Speed.	Armament.	Torpedo Tubes.	Complement.	Fuel, Oil.
			Length (Extreme.)	Beam.	Draught.	Number of Screws.							
DESTROYERS— <i>continued.</i>			Feet.	Feet.	Feet		Tons.	Knots.					Tons.
Caldwell .. .	Mare Island N.W.	1917	315·5	30·7	9·5	..	1020	21,000	30	{ 4 4-in., 1 3-in. A.A.			
Allen .. .	Bath I.W.	1917	315·3	29·9	9·8	..	920	17,500	30	{ 4 4-in., 1 3-in. A.A.	4	triple 122	290
Rowan .. .	Fore River S.B. Co.	1916	315·3	29·9	10·7	..	920	17,000	29·5	{ 4 4-in., 1 3-in. A.A.	21-in.		
Sampson .. .													
Wadsworth .. .	Bath I.W.	1915	315·3	29·9	10	..	910	17,500	30	4 4-in.	4 dbl.	118	310
†No. 55 ex-Cushing .. .	Fore River S.B. Co.	1915	305·3	30·4	10·5	..	860	17,000	29	{ 4 4-in., 1 3-in. A.A.	4 dbl.	106	308
†No. 53 ex-Winslow .. .													
Nicholson .. .													
O'Brien .. .													
†No. 50 ex-Balch .. .													
Benham .. .													
Parker .. .	Cramp.	1914											
†No. 47 ex-Aylwin .. .													
Duncan .. .	Fore River S.B. Co.	1914											
		1913	305·3	30·4	10	..	820	16,000	29				
†No. 45 ex-Downes .. .	N.Y.S.B. Co.	1915	305·3	30·4	9·8	..	820	16,000	29	4 4-in.	4 dbl.	104	306
†No. 44 ex-*Cummings .. .	Bath I.W.	1913											
†No. 43 ex-*Cassin .. .													
†No. 54 ex-*McDougal .. .	Bath I.W.	1914	305·3	30·6	9·8	..	860	16,000	29·5				(311
*Ericsson .. .	N.Y.S.B. Co.	1915	305·3	30·6	10·7	..	860	17,000	29				305
†No. 57 ex-*Tucker .. .	Fore R.S.B.C.	1916	305·3	29·9	10·8	..	910	17,000	29·5	4 4-in.	4 dbl.	104	309
†No. 58 ex-*Conyngham .. .	Cramp.	1916	315·3	29·9	10·1	..	910	18,500	29·5		18-in.		308
†No. 59 ex-*Porter .. .	Cramp.	1916	315·3	29·9	10·1	..	910	18,000	29·5				308
*Wainwright .. .	N.Y.S.B. Co.	1916	315·3	29·9	10·7	..	910	17,000	29·5				308
*Davis .. .	Bath, I.W.	1916	315·3	29·9	9·8	..	920	17,500	30				290
*Wilkes .. .	Cramp.	1917	315·3	29·9	10·7	..	920	18,000	29·5	{ 4 4-in., 1 3-in. A.A.	4 triple	120	290
*Shaw .. .	Mare L, N.Y.	1916	315·3	29·9	10·7	..	910	17,000	29·5	2 3-in. A.A.	21-in.		290
DESTROYERS NOW FITTED AS MINELAYERS—													
Sproston .. .	Union I.W.	1919											
Anthony .. .													
Ingraham .. .													
Lansdale .. .													
Luce .. .													
Israel .. .	Fore River S.B. Co.	1918	314·4	30·5	9	2	1,160	27,000	35	{ 4 4-in., 1 3-in. A.A. (92 mines)	—	107	283
Murray .. .													
Stribling .. .													
Lamsay .. .	Newport	1918	314·4	30·5	9	2	1,160	25,000	35	{ 4 4-in., 1 3-in. A.A.	—	120	286
Gamble .. .													
Breese .. .	News S. Co.	1919											
Montgomery .. .													

\* Operated by the U.S. Coast Guard.

† These destroyers have been reverted to their numbers, and names have been taken for the 1933–1934 programme destroyers.

## United States—continued.

Name or Number.	Where built.	Completed.	Dimensions.				Number of Screws.	Displacement. Surface. Submerged.	Horse-Power.	Maximum Speed. Surface. Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel.	
			Length (Extreme)	Beam.	Draught.	Feet.								Oil.	
SUBMARINES—															Tons.
Porpoise .. .	Portsmouth Navy Yard.	Bldg. est. 1936	283	24·9	13	..	1290 estd.	..	..	..	3 in.				
Pike .. .		Bldg. est. 1936													
Shark .. .	Electric Boat Co.	Bldg. est. 1935	288	25·1	13·9	..	1320 estd.	..	..	..	3 in.				
Tarpon .. .															
V7 Dolphin	Portsmouth Navy Yard.	1932	307	27·8	13	..	2,215	—	4,250	17 8	1 4-in.	6	58	..	21*
V8 Cachalot .. .	Electric Boat Co.	1934	260	24·8	13	..	1,110	3,100	—	17 8	13-in. A.A.	6	..	..	21*
V9 Cuttlefish .. .															
V4 Argonaut	Portsmouth Navy Yard.	1928	381	33·7	15·4	..	1,650	2,710	3,175	15 8	2 6-in., 60 mines	4	86	..	21*
V5 Narwhal	Portsmouth Navy Yard.														
V6 Nautilus	Mare Island Navy Yard.	1930	371	33·3	16	..	3,960	2,730	5,450	17 85	2 6-in.	6	88	..	21*
V8 Bonita .. .	Portsmouth Navy Yard.	1926													
V2 Bass .. .		1925	341·5	27·5	15·5	..	2,000	6,700	—	14 9	1 5-in. (Bass has 1 3-in. A.A.)	6	87	..	21*
V1 Barracuda .. .		1924													
S48 .. .	Lake T.B. Co., Bridgeport	1922	265·3	21·8	13·5	..	1,000	2,000	—	14·8 11·0	1 4-in.	5	..	237	21*
S47* .. .		1925													
S46* .. .		1925													
S45* .. .	Bethlehem Shipbuilding Corp., Quincy Plant	1925	225·3	20·5	16	..	850	1,200	—	14 10	1 4-in.	4	44	154	12*
S48* .. .		1924													
S42* .. .		1924													
S41* .. .		1924													
S40* .. .		1923													
S39* .. .		1923													
S38* .. .		1923													
S37* .. .		1923													
S36* .. .	Bethlehem Shipbuilding Corp., Union Plant	1923													
S35* .. .		1923													
S34* .. .		1923													
S33* .. .		1923													
S32* .. .		1923													
S31* .. .		1923													
S30* .. .		1920													
S29* .. .		1924													
S28* .. .		1923													
S27* .. .		1924													
S26* .. .		1923													
S25* .. .		1923													
S24* .. .	Bethlehem Shipbuilding Corp., Quincy Plant	1923													
S23* .. .		1923													
S22* .. .		1924													
S21* .. .		1923													
S20* .. .		1922													
S19* .. .		1921													
S18* .. .		1923													
S17 .. .		1921													
S16 .. .	Lake T.B. Co., Bridgeport	1920	231	21·5	13	..	790	2,000	—	15·25 9	1 4-in.	4	21*	38	123
S15 .. .		1921					1,092	1,200	—						
S14 .. .		1921													
S13 .. .		1923													
S12 .. .		1923													
S11 .. .		1923													
S10 .. .		1922													
S9 .. .	Navy Yard, Portsmouth	1921													
S8 .. .		1920													
S7 .. .		1920													
S6 .. .		1920													
S4† .. .		1919													
S3 .. .		1919													
S1* .. .	Fore River S.B. Co.	1920	219·3	20·7	16	..	800	1,200	—	14·5 11	1 4-in., 1 aeroplane	4	21*	38	140
							1,062	1,500	—						

\* Designed by Electric Boat Co., Groton, Conn.

† Used for salvage operations.

Six submarines are included in the 1933–1934 building programme, and are to be built as follows:—Three of about 1,300 tons each by the Electric Boat Co., Groton, at an approximate cost of £478,000 each, the Plunger, Pinna and Pollack; two at the Portsmouth Navy Yard, the Perch and Pickerel; and one at the Mare Island Navy Yard, the Pompano.

United States—*continued.*

Name or Number.	Where built.	Completed.	Dimensions.			Number of Screws.	Displacement. Surface. Submerged.	Horse-Power.	Maximum Speed. Surface. Submerged.	Armament.	Torpedo Tubes.	Complement.	Fuel Capacity. Tons.
			Length. (Extreme.)	Beam.	Draught.								
Feet.	Feet.	Feet.	Tons.	Knots									
<b>SUBMARINES— <i>continued.</i></b>													
R20* . . .	Union, I.W.	1918	186.1	18	14.5	2	$\frac{530}{680}$	880 934	13.5 10.5	1 3-in.	$\frac{4}{21^*}$	30	63
R19* . . .													
R18* . . .													
R17* . . .													
R16* . . .													
R15* . . .													
R14* . . .													
R13* . . .													
R12* . . .													
R11* . . .													
R10* . . .	Fore River S.B. Co.	1919	172.3	18	14.4	2	$\frac{480}{629}$	880 740	14 10.5	1 3-in.	$\frac{4}{21^*}$	30	73
R9* . . .													
R8* . . .													
R7* . . .													
R6* . . .													
R5* . . .													
R4* . . .													
R3* . . .													
R2* . . .													
R1* . . .													
O10*§ . . .	Fore River S.B. Co.	1918	172.3	18	14.4	2	$\frac{480}{629}$	880 740	14 10.5	1 3-in.	$\frac{4}{21^*}$	30	73
O9*§ . . .													
O8* . . .													
O7* . . .													
O6* . . .													
O5* . . .													
O4* . . .	Union, I.W.	1918	186.1	18	14.5	2	$\frac{530}{680}$	880 934	13.5 10.5	1 3-in.	$\frac{4}{21^*}$	30	63
O3* . . .													
O2* . . .													
O1* . . .													

\* Designed by Electric Boat Co., Groton, Conn.

§ To be disposed of shortly.

The machinery contractors for the vessels of the E. B. Co. Design built in yards other than the Navy Yards were the New London Ship and Eng. Co., Groton, Conn., and the hulls were built under sub-contract from the E. B. Co.



# **TABLES OF COMPARATIVE NAVAL STRENGTH**



TABLE I.—EFFECTIVE FIGHTING SHIPS, BUILT, BUILDING, AND AUTHORISED.

Class.	British Empire.	U.S.A.	Japan.	France.	Italy.	Soviet Union. (*)	Germany.
Battleships, 14-in. guns and upwards .	12 —	—	14 —	—	—	—	—
Battleships, smaller guns . . . . .	— —	— —	1 —	—	—	—	—
Battle-cruisers . . . . .	3 —	—	— —	—	—	—	—
Aircraft and seaplane carriers . . . . .	8 (b) —	—	1 4	2 —	—	—	—
(f) Cruisers, guns above 6-1-in. . . . .	19 —	—	16 (l)	2 1	12 (g)	—	—
(f) Cruisers, guns 6-1-in. and below . . .	31 9	4 (k)	10 4	3 19 (h)	4 1	8 (m) 6	—
Fleet Leaders and Destroyers . . . . .	161 18	9 (k) 227 (n)	27 14(a)	98 9 (o) 3 82(p)	2 1 91(q) 6	—	—
Submarines . . . . .	54 7	5 (k) 84	4 6	66 4	—	100 9 2	46 25 —

## NOTES.

(a) 2 of 1850 and 12 of 1500 tons, 1933-34 programme.

(b) Includes "Albatross," seaplane carrier, and "Ark Royal," aircraft tender.

The latter is used for experimental work.

(c) Includes "Notoro" and "Kamoi," seaplane carriers.

(d) Includes "Commandant Teste," aviation transport, a special type under the terms of the London Naval Treaty.

(e) "Miraglia," seaplane carrier.

(f) Cruiser minelayers are not included in these totals.

(g) In addition there are 7 old cruisers classed as coast defence vessels 1st class.

(h) In addition there is an old cruiser classed as coast defence vessel, 2nd class.

(i) Includes the old cruiser "F. Ferruccio," and also 3 armoured cruisers classified as battleships, 2nd class, in Italian official lists.

(k) 1934 programme.

(l) Includes the old cruiser "Rochester," listed for disposal.

(m) Includes the old cruiser "Gueydon."

(n) Includes destroyers equipped as fast transports, etc. In addition to this total there are 12 destroyers fitted as minelayers, and 16 operated by the U.S. Coast Guard.

(o) 4 torpedo boats also building.

(p) There are 4 first class torpedo boats in addition.

(q) There are 4 first class torpedo boats in addition.

(r) There are 9 torpedo boats in addition and 5 torpedo boats are projected to commence in 1936.

(s) Includes vessels under French protection at Bizerte.

(t) Exact number uncertain—many of these are at present of no fighting value.

TABLE II.—BATTLESHIPS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.		UNITED STATES.		JAPAN.		FRANCE.		ITALY.		SOVIET UNION.		GERMANY.	
Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.
1925 Nelson ...	33,600	1921 Colorado ...	32,500	1920 West Virginia ...	31,800	1919 Mutsu ...	32,720	1921 Muten ...	31,800	Nagato ...	32,720	1921 Ise ...	32,720
1925 Rodney ...	33,900	1921 ...	31,500	1919 ...	31,500	1917 Hyuga ...	29,980	1921 ...	31,500	... 1919 Tennessee ...	29,980	1921 ...	29,980
1914 ...	31,100	1919 ...	31,500	1919 ...	32,300	1916 Ise ...	29,330	1919 ...	32,300	1915 Yamasaburo ...	29,330	1919 ...	29,330
1913 Queen Elizabeth ...	31,100	1917 Idaho ...	30,800	1914 Fuso ...	30,800	1914 ...	29,330	1917 ...	30,100	1913 Haruna ...	29,330	1917 ...	29,330
1913 Warspite ...	31,100	1917 New Mexico ...	30,000	1913 ...	32,600	1912 Kongo ...	27,000	1917 ...	30,100	1913 ...	27,000	1917 ...	27,000
1915 Royal Sovereign ...	31,100	1915 Mississippi ...	30,000	1913 ...	32,600	1912 ...	27,000	1915 ...	30,100	1913 ...	27,000	1915 ...	27,000
1914 Royal Oak ...	29,150	1915 Arizona ...	32,100	1915 ...	32,600	1912 ...	27,000	1915 ...	30,100	1913 ...	27,000	1915 ...	27,000
1915 Reservista ...	29,150	1914 Pennsylvania ...	29,000	1914 ...	29,000	1912 ...	27,000	1914 ...	30,100	1913 ...	27,000	1914 ...	27,000
1916 Resolution ...	29,150	1914 Oklahoma ...	29,000	1914 ...	29,000	1912 ...	27,000	1914 ...	30,100	1913 ...	27,000	1914 ...	27,000
1916 Ramillies ...	29,150	1914 Nevada ...	29,000	1914 ...	29,000	1912 ...	27,000	1914 ...	30,100	1913 ...	27,000	1914 ...	27,000
1916 ...	29,150	1912 Texas ...	27,000	1912 ...	27,000	1912 ...	27,000	1912 ...	30,100	1913 ...	27,000	1912 ...	27,000
12 ships.	368,650	14 ships.	428,300	9 ships.	428,300	9 ships.	272,070	9 ships.	428,300	9 ships.	272,070	9 ships.	272,070

TABLE III.—BATTLE-CRUISERS WITH 14-IN. GUNS AND UPWARDS.

BRITISH EMPIRE.		UNITED STATES.		• JAPAN.		FRANCE.		ITALY.		SOVIET UNION.		GERMANY.	
Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.	Name.	Launched.
1918 Hood ...	tons,	1916 Renown ...	42,100	1916 Repulse ...	32,000	1916 ...	tons.	1916 ...	32,000	1916 ...	106,100	1916 ...	106,100
1916 ...	42,100	1916 ...	32,000	1916 ...	32,000	1916 ...	106,100	1916 ...	106,100	1916 ...	106,100	1916 ...	106,100
3 ships.	106,100	3 ships.	106,100	3 ships.	106,100	3 ships.	106,100	3 ships.	106,100	3 ships.	106,100	3 ships.	106,100

• Hiyu (Japan) is retained as a training ship in accordance with London Naval Treaty.

† The displacement of these ships will be increased by about 1000 tons during present modification.

TABLE IV.—BATTLESHIPS WITH GUNS BELOW 14-IN.

\* Emperor of India and Marlborough (Great Britain) and Florida and Utah (United States) were disposed of in [§3] in accordance with the London Naval Treaty, and Iron Duke (Great Britain) and Wyoming (United States) were retained as training ships.

TABLE VI.—CRUISERS.

Note.—Vessels under construction in Italics. Cruisers marked • have guns above 6-in.

BRITISH EMPIRE.		UNITED STATES.		JAPAN.		FRANCE.		ITALY.		SOVIET UNION.		GERMANY.	
Speed. kts.	Name. Displace- ment tons.	Speed. kts.	Name. Displace- ment tons.	Speed. kts.	Name. Displace- ment tons.	Speed. kts.	Name. Displace- ment tons.	Speed. kts.	Name. Displace- ment tons.	Speed. kts.	Name. Displace- ment tons.	Speed. kts.	Name. Displace- ment tons.
32½	London •	9,750	Omaha	33	Nachi •	33½²	Tourville •	36	Trento •	29	Proletarn ...	7,600	Kits.
32½	Devonshire •	9,750	Milwaukee	33	Myoko •	10,000	Thouars •	35	Trieste •	29	Chernaya	7,600	Finden
32½	Shropshire •	9,730	Cincinnati	33	Akihara •	10,000	Suffren •	37	Taranto •	32	Ukraina	7,600	Hünigenberg
32½	Sussex *	9,730	Raleigh	33	Hakuro •	10,000	Duguay-Trouin	33	Quarto •	29	Kornilov †	6,675	Karlshafen
31	Berwick •	9,750	Detroit	33	Kako •	10,000	La Motte Picquet	37	Ancona	32	General	6,675	Königberg
31	Cornwall •	9,750	Richmond	33	Furukawa •	10,000	Primauguet	33	Bari •	32	Almaz †	6,675	Karlsruhe
31	Kent •	9,850	Concord	33	Kinugasa •	10,000	Metz	33	Brindisi	32	Aurora ...	3,310	Leipzig
31	Suffolk •	9,800	Trenton	33	Aoba •	10,000	Strasbourg	26	Venezia	27	... ...	3,310	Berlin
31	Cumberland	9,750	Marblehead	33	Naka •	10,000	(ex Königsberg)	26	Lubia ...	22	Krasni * a	6,730	... ...
31	Australia (A.)	9,850	Memphis	33	Sendai	10,000	(ex Regensburg)	26	Libia ...	29	Kavkas ...	7,600	(normal)
31	Canberra (A.)	9,860	Rochester ♦	8,150	Nagara	10,000	(ex Reichenburg)	27	San Giorgio •	32	Voroshilov	7,600	... ...
33	Emerald	7,550	Salt Lake	33	Kinu ...	10,000	Tilbury ...	27	San Marco •	32	—	7,600	... ...
33	Enterprise	7,580	City	33	Asakuma ...	10,000	Trieste ...	27	Pisa * ...	32	Admiral Ismailian	7,600	Admiral
30½	Eflinham	9,770	Pensacola *	33	Natori	10,000	Wuldeck	23	Alberto da ...	37	—	7,600	—
30½	Frobisher	9,980	Northumb- ton *	33	Iwata	10,000	Rous-	23	Guissano	37	Admiral Kornilov	7,600	Admiral
29½	Hawkins	9,400	Chester *	9,050	Yura	10,000	Weymouth	23	Alberto di ...	37	Barblano	5,069	—
29	Daspatch	32½	Portland	9,210	Yudзу	10,000	Colleoni	23	Jules Michelet •	11,072	Barbolomeo	—	—
29	Biondore (K.z.)	32½	Chester *	9,210	Yuda	10,000	Giov. della	32	Colbert •	37	—	—	—
29	Durban	32½	Chicago	9,050	Kuna ...	10,000	Bande Nere	32	Foch •	10,000	—	—	—
29	Delhi	32½	Houston	9,050	Tama ...	10,000	Zara	32	Dupleix	37	—	—	—
29	Dunedin (K.z.)	4,850	Portland	9,050	Kitakami	10,000	Flame	32	Jeanne d'Arc	32	—	—	—
29	Dunedin (K.z.)	4,850	Indiana	9,050	Kiso ...	10,000	Georges Leygues	31	Alberto di ...	10,000	—	—	—
29	Dauntless	32½	Dragon	9,950	Oi	10,000	Monteruccoli	31	Algerio ...	32	—	—	—
29	Cardiff	32½	Portsmouth	9,950	Yubari	10,000	Attendolo ...	31	Jean de Vienne	7,600	—	—	—
29	Coventry	32½	San Francisco	9,950	Tenryu	10,000	Federico di ...	31	Orsini ...	32	—	—	—
29	Curlew	4,290	New Orleans *	10,000	Tatsuta	10,000	Lungi Cadorna	31	Glorie ...	37	—	—	—
29	Cairo	4,200	Orleans *	10,000	Yabagai	10,000	—	31	Morettaise ...	32	—	—	—
29	Calcutta	4,200	Astoria	10,000	Ilirado	10,000	—	31	Monte ...	32	Luigi Diaz	5,069	Soviet
29	Colombo	4,200	Minneapolis	10,000	Takao	10,000	—	31	Morettaise ...	32	—	—	—
29	Cardiff	32½	Tuscalosa *	10,000	Atago	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	San	10,000	Chokai	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco *	10,000	Maya	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Francisco	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cardiff	32½	Minneapolis	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Coventry	32½	Tuscalosa *	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Curlew	4,290	Francisco	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Cairo	4,200	Quiancy	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Calcutta	4,200	Encarnacion	10,000	Yamato	10,000	—	31	Monte ...	32	—	—	—
29	Colombo	4,200	Astoria	10,000	Yamato	10,000	—	31	Monte				





BRITISH AND FOREIGN  
ORDNANCE TABLES



# VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

Tables Corrected by the Manufacturers, November, 1894.

## NAVAL GUNS AND MOUNTINGS.

System . . . . .	40 mm. 2-pdr.	40 mm. 2-pdr.	47 mm. 3-pdr.	57 mm. 6-pdr.	101·6 mm. 120 mm.	4·in. 101·6 mm.	4·7-in. 120 mm.	5·118-in. 120 mm.	5·5-in. 139·7 mm.	5·906-in. 150 mm.
	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore . . . . .	1·575	1·575	1·86	2·244	4	4	4·724	5·118	5·5	5·906
do. . . . .	40	40	47	57	101·6	101·6	120	130	139·7	150
Length of Bore . . . . .	39·37	50	50	50	45	45	50	52	50	50
Weight of Gun . . . . .	Ibs.	Ibs.	c. q. lb.	c. q. lb.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.	t. c. q.
do. . . . .	650	655	1·433	5	9·1	36·0	2·032	3·000	4·470	7·315
Weight of Projectile . . . . .	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
do. . . . .	0·91	0·91	1·5	2·72	14·06	22·0	22·0	30·85	38	45·4
Muzzle Velocity . . . . .	f.s.	2·360	2·625	2·800	2·600	2·700	2·759	3·000	3·000	2·040
do. . . . .	600	720	800	853	792	823	850	915	914	896
Muzzle Energy . . . . .	m.s.	67	105	180	280	1·585	1·935	2·010	2·425	5·995
do. . . . .	f.t.	20·4	32	55·76	86·7	485	600	935	1·315	1·857
Penetration (W.I. at muzzle). . . . .	m.t.	..	..	67	7·5	13·6	16	18·0	22	23
do. . . . .	ins.	..	..	170	190	345	420	480	510	585
Rounds per Minute . . . . .	min.	290	290	30	28	18	12	12	12	12
Weight of Mounting and Shield . . . . .	kg.	1·676	1·676	Ibs.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.
do. . . . .	790	790	790	2·128	11·1	23·17	3	10·2	18·3	14·5
Weight of Shield . . . . .	kg.	..	..	965	586	906	2·985	3·315	7·887	0
do. . . . .	..	..	..	..	..	..	..	5·007	9·188	14·517
Thickness of Shield . . . . .	mm.	..	..	..	..	..	..	..	9·246	0
do. . . . .	deg.	..	..	..	..	..	..	..	..	..
Angle of Elevation . . . . .	deg.	..	..	..	..	..	..	..	..	..
Angle of Depression . . . . .	deg.	..	..	..	..	..	..	..	..	..

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured for some of the above having approximately the same characteristics.

VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. NAVAL GUNS AND MOUNTINGS—*continued.*

	6-in. 152 mm.	6-in. 152 mm.	8-in. 203 mm.	8-in. 203 mm.	8-in. 203 mm.	9-2-in. 234 mm.	10-in. 254 mm.	12-in. 305 mm.	13-5-in. 343 mm.	14-in. 356 mm.	15-in. 381 mm.	16-in. 406 mm.
Diameter of Bore	6	6	8	8	8	8	10	12	13-5	14	15	16
do.	152.4	152.4	203.2	203.2	203.2	237	254	304.8	332.9	355.6	381	406.2
Length of Bore	45	50	45	50	55	50	50	45	45	45	45	45
Weight of Gun	kg.	kg.	t. c. q.	t. c. t. c.	t. c. t. c. q.	t. c. t. c. q.	t. c. t. c. q.	t. c. t. c.	t. c. t. c.	t. c. t. c.	t. c. t. c.	t. c. t. c.
do.	6,605	6,985	6,172	14.0	15.14	16.10	28.16.2	26.1	43.10	66.0	80.0	105.0
Weight of Projectile	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
do.	100	100	250	250	256	256	290	290	44.200	67.060	81.284	106.685
Muzzle Velocity	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
do.	45.36	45.4	113.4	116.0	116.0	116.0	172.37	226.8	385.6	635	707.6	1,051
Muzzle Velocity	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.	m.s.
do.	2,830	3,000	2,845	3,000	3,150	3,000	2,933	2,933	2,933	2,933	2,933	2,933
Muzzle Energy	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.	ft.s.
do.	6,630	6,240	14,030	15,976	17,615	23,714	29,825	50,705	60,675	66,260	74,550	97,390
Penetration (W.I. at muzzle)	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.	m.t.
do.	1,745	1,930	4,345	5,445	7,340	9,235	15,705	18,790	20,520	26,185	30,160	30,160
Rounds per Minute	ins.	ins.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
Weight of Mounting and Shield	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
do.	12,912	12,245	146,800	150,000	152,000	261,100	291,600	438,000	567,000	597,500	629,000	670
Weight of Shield	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
do.	4,431.6	4,431.5	4,400	2,400	2,400	2,400	103,600	117,000	153,400	195,100	194,000	180,700
Thickness of Shield	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
do.	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1	1.5 & 1
Angle of Elevation	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.
Angle of Depression	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.	deg.

The above guns are of all-steel construction. Guns of steel and wire construction are manufactured for some of the above having approximately the same characteristics.

## VICKERS-ARMSTRONGS Limited—GUNS AND MOUNTINGS.

## HOWITZERS AND FIELD GUNS.

Diameter of Bore	Ins.	2.953	4.134	4.134-in.										
do.	mm.	75	105	105	105	105	105	105	105	105	105	105	105	105
Length of Bore	Ins.	30	21	26	35	45	50	50	50	50	50	50	50	50
Weight of Gun	c. q. cal.	7 q. 3	9 q. 11	9 q. 12	9 q. 15	9 q. 13	9 q. 14							
Weight of Projectile	kg.	30.4	50.7	58.4	61.0	62.7	67.5	67.5	72.6	72.6	72.6	72.6	72.6	72.6
Muzzle Velocity	kg.	14.33	14.33	26.45	33.07	34.74	35.27	35.27	35.27	35.27	35.27	35.27	35.27	35.27
do.	do.	6.5	6.5	12.0	15.0	15.5	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Muzzle Energy	kg.	7.50	7.50	9.40	2.000	2.454	2.690	2.953	2.790	2.903	2.790	2.903	2.790	2.903
do.	do.	m.t.	m.s.	1.61	1.608	1.608	1.608	1.608	1.608	1.608	1.608	1.608	1.608	1.608
Rounds per Minute	m.t.	1.17	1.17	1.47	4.74	9.15	1.470	1.770	2.133	2.830	2.270	5.730	14.350	13.915
Weight of Mounting and Shield	kg.	1.091	1.210	1.25	1.4	2.84	4.48	6.59	8.77	10.0	4	4.185	15.705	20.185
do.	do.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
Weight of Shield	kg.	80.7	87	116	125	125	125	125	125	125	125	125	125	125
Thickness of Shield	mm.	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Angle of Elevation	deg.	40	45	45	45	45	45	45	45	45	45	45	45	45
Angle of Depression	deg.	6	8	5	5	5	5	5	5	5	5	5	5	5

	TANK GUNS.			FOR VICKERS CARDEN LOUD VEHICLE.			MOUNTAIN HOWITZERS.			LANDING GUN.		
	57 mm. 6-pdr. Semi-Auto.	47 mm. 3-pdr. Semi-Auto.	47 mm. 3-pdr.	2.953-in. (76 mm.) Jointed.	2.953-in. (76 mm.) Jointed.	4.134-in. (105 mm.) Jointed.	3-in. (76.2 mm.)	3-in. (76.2 mm.)	3-in. (76.2 mm.)	3-in. (76.2 mm.)	3-in. (76.2 mm.)	3-in. (76.2 mm.)
Diameter of Bore	Ins. mm. cal.	2.214	1.85	1.85	1.85	1.85	1.148	1.148	1.148	1.148	1.148	1.148
Length of Bore	Ins. mm. cal.	5.7	4.7	3.5	4.7	2.1	2.2	2.2	2.2	2.2	2.2	2.2
Weight of Gun	kg. lb.	27	2	2	2	1b.	1b.	1b.	1b.	1b.	1b.	1b.
Weight of Projectile	kg. lb.	2	14	9	2	0	3	3	3	3	3	3
do.	do.	183	6	127	33	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Muzzle Velocity	t.s.	1,200	1,854	1,600	984	1,450	1,450	1,450	1,450	1,450	1,450	1,450
do.	m.s.	366	565	488	300	442	350	350	350	350	350	350
Muzzle Energy	t.t.	60	79	63.6	22.2	210	242	242	242	242	242	242
do.	do.	18.6	24.6	18.1	6.9	65.0	74.6	74.6	74.6	74.6	74.6	74.6
Rounds per Minute	m.t.	..	..	..	..	18	10	10	10	10	10	10
Weight of Mounting and Shield	kg. do.	kg.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.
do.	do.	140	21	2	2	127	127	127	127	127	127	127
Weight of Shield	kg. do.	kg.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.	q. lb.
Thickness of Shield	kg. do.	kg.	..	..	..	..	..	..	..	..	..	..
do.	do.	do.	..	..	..	..	..	..	..	..	..	..
Angle of Elevation	deg. do.	deg.	..	..	..	..	..	..	..	..	..	..
Angle of Depression	deg. do.	deg.	..	..	..	..	..	..	..	..	..	..

## VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

	44-60 mm.		47 mm.		65 mm.		70 mm. with 25·4 mm. S.C. Tube, on Platform Carriage.	
	44 mm. Barrel.	60 mm. Barrel.	Armour-Piercing Ammunition.	High-Explosive Ammunition.	High Explosive Ammunition.	70 mm. Barrel.	70 mm. with 25·4 mm. S.C. Tube.	
Diameter of Bore	1·73	2·36	1·85	2·550	2·756	1·0		
do.	44	60	47	65	70	25·4		
Length of Bore	30	20	21	16	15	50		
Barrel.	Breech Ring.	Breech Mechanism.	Breech Ring.	Breech Mechanism.	Breech Ring.	Gun and Mechanism.	S.C. Tube.	
75 lb.	50 lb.	26 lb.	68 lb.	82 lb.	38 lb.	17	172 lb.	56·5 lb.
34	22·7	11·8	34	30·8	12·7	28	78	25·6
2·75	5·6	3·3	3·3	3·3	8·8	8·8	4	0·65
1·25	2·5	1·5	1·5	1·5	4	4	4	0·25
1,708	732	1,600	755	820	700	700	2461	2461
520	223	488	230	250	213	213	750	750
66·5	20·4	68·6	13·0	41·0	30	30	23·1	23·1
17·2	6·3	13	4	12·7	9·3	9·3	7·15	7·15
Weight of Mounting and Shield	326	397	556	556	558 with Platform and S.C. Tube			
do.	148	180	252	252	253	253	253	253
Weight of Shield	—	45	106	106	106	106	106	106
do.	—	20·4	48	48	48	48	48	48
Thickness of Shield	ins.	0·14	0·16	0·16	0·16	0·16	0·16	0·16
do.	mm.	3·5	4	4	4	4	4	4
Angle of Elevation	44 mm. Barrel.	60 mm. Barrel.	Low Position.	High Position.	Low Position.	High Position.	45	45
Angle of Depression	10	20 to 60	15	45	20	45	45	45
do.	5	0	10	2·5	10	2·5	2·5	2·5

## VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS. GUNS MOUNTED ON AIRCRAFT.

	* .303-in. (7·7 mm.) Observer's gun.	* .303-in. (7·7 mm.) Observer's gun.	* .303-in. (7·7 mm.) Pilot's gun.	.5-in. (12·7 mm.) Observer's gun.	.5-in. (12·7 mm.) Pilot's gun.	.5-in. (12·7 mm.) Observer's Gun.	.5-in. (12·7 mm.) Observer's gun.	1·457-in. (37 mm.) Observer's gun.	1·575-in. (40 mm.) Observer's gun.
System	• • • • •	Vicker-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers-Armstrongs Gas operated.	Vickers-Semi-Auto. operated.
Diameter of Bore	• ins.	.303	.303	.5	.5	.5	.5	1·457	1·575
do.	mm.	7·7	7·7	12·7	12·7	12·7	12·7	37	40
Length of Bore	• cal.s.	72	93·2	60	62·2	72	72	39·6	40
Weight of Gun	• lb.	20·5	25	45	52·5	70	70	200	234
do.	kg.	9·3	11·3	12	20·4	32	32	90·72	106
Weight of projectile	• lb.	174 grs.	174 grs.	565 grs.	565 grs.	600 grs.	600 grs.	1·457	2
do.	kg.	11·3 grms.	11·3 grms.	36·6 grms.	36·6 grms.	44·7 grms.	44·7 grms.	0·666	0·91
Muzzle Velocity	• f.s.	2,400	2,400	2,450	2,550	2,800	2,800	1050	2,300
do.	do.	732	732	744	746	863	863	594	700
Muzzle Energy	• f.t.	0·9	0·9	1	3·36	5·4	5·4	40·2	73
do.	do.	0·28	0·28	0·31	1·04	1·125	1·125	12·45	22·6
Rounds per Minute	• m.t.	900-1000	650-750	900-1000	350-650	350-650	350-650	100	100
Weight of Mounting	• lb.	5	..	..	..	..	..	102	102
do.	kg.	0·9	..	..	..	..	..	46	46
Angle of Elevation	• deg.	90	..	..	..	..	..	65	65
Angle of Depression	• deg.	90	..	..	..	..	..	60	60

## MACHINE GUNS—ANTI-AIRCRAFT.

	* .303-in. (7·7 mm.)	* .303-in. (7·7 mm.)	.5-in. (12·7 mm.)	.5-in. (12·7 mm.)	.5-in. (12·7 mm.)
System	• • • • •	Vickers Recoil operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.
Diameter of Bore	• ins.	.303	.303	.5	.5
do.	mm.	7·7	7·7	12·7	12·7
Length of Bore	• cal.s.	93·2	72	62·2	90
Weight of Gun	• lb.	32	22	52·5	101
do.	kg.	14·6	10	23·8	40·6
Weight of Projectile	• lb.	174 grs.	174 grs.	565 grs.	600 grs.
do.	kg.	11·3 grms.	11·3 grms.	36·6 grms.	44·7 grms.
Muzzle Velocity	• f.s.	2,440	2,400	2,550	3,000
do.	do.	744	732	777	690 grms.
Muzzle Energy	• f.t.	1	0·9	3·64	44·7 grms.
do.	do.	m.t.	0·28	1·125	3,000
Rounds per minute	•	500-600	450-500	350-650	2,800

\* This gun can be adapted to fire any pattern of rifle calibre ammunition.

## VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.

		ANTI-AIRCRAFT GUNS.																										
		40 mm. 2-pdr.			40 mm. 2-pdr.			47 mm. 3-pdr.			Mobile 75 mm. 40 Calibre			Mobile 75 mm. .45 Calibre			3-inch			4-in.			105 mm. .45 Calibre			4·7-in.		
System		Auto.		Auto.		Semi-Auto.		Semi-Auto.		Semi-Auto.		Q.F.		Semi-Auto.		Semi-Auto.		Semi-Auto.		Semi-Auto.		Semi-Auto.		Semi-Auto.		Semi-Auto.		
Construction		Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel		
Diameter of bore	Ins. mm.	1·575	1·575	1·575	1·575	1·85	2·953	2·953	2·953	2·953	2·953	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4		
Length of bore	Ins. mm.	39·37	50	50	50	40	47	75	75	75	75	76·2	76·2	76·2	76·2	76·2	76·2	101·6	101·6	101·6	101·6	101·6	101·6	101·6	101·6	101·6		
Weight of gun	kg. lb.	5·90	6·55	6·55	6·55	6·50	6·50	6·50	6·50	6·50	6·50	6·5	6·5	6·5	6·5	6·5	6·5	45	45	45	45	45	45	45	45	45		
Weight of projectile	kg. lb.	2·68	2·68	2·68	2·68	2·0	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7	1·7		
Weight of cartridge	kg. lb.	.2	.2	.2	.2	2·205	2·205	2·205	2·205	2·205	2·205	3·3	3·3	3·3	3·3	3·3	3·3	14·33	14·33	14·33	14·33	14·33	14·33	14·33	14·33	14·33		
Muzzle velocity	ft.s. m.s.	.01	.01	.01	.01	1·5	1·5	1·5	1·5	1·5	1·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5	6·5		
Muzzle energy	f.t. m.t.					2·625	2·625	2·625	2·625	2·625	2·625	2·800	2·800	2·800	2·800	2·800	2·800	2·160	2·160	2·160	2·160	2·160	2·160	2·160	2·160	2·160		
Rounds per minute	r.p.m.					2·360	2·360	2·360	2·360	2·360	2·360	4·00	4·00	4·00	4·00	4·00	4·00	7·80	7·80	7·80	7·80	7·80	7·80	7·80	7·80	7·80		
Weight of mounting	kg. lb.					6·00	6·00	6·00	6·00	6·00	6·00	6·53	6·53	6·53	6·53	6·53	6·53	8·23	8·23	8·23	8·23	8·23	8·23	8·23	8·23	8·23		
(exclusive of gun)	kg. deg. deg.					600	600	600	600	600	600	103	103	103	103	103	103	1·565	1·565	1·565	1·565	1·565	1·565	1·565	1·565	1·565		
Angle of elevation	deg. deg.					67	67	67	67	67	67	32	32	32	32	32	32	1·480	1·480	1·480	1·480	1·480	1·480	1·480	1·480	1·480		
Angle of depression	deg. deg.					17	17	17	17	17	17	200	200	200	200	200	200	20	20	20	20	20	20	20	20	20		
						c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	c. q. lb.	12	12	12	12	12	12	t. c. q. lb.	t. c. q. lb.	t. c. q. lb.	t. c. q. lb.							
						14	14	14	14	14	14	3	3	3	3	3	3	2	2	2	2	2	2	2	2	2		
						24	24	24	24	24	24	..	..	..	..	..	..	2·121	2·121	2·121	2·121	2·121	2·121	2·121	2·121	2·121		
						760	760	760	760	760	760	85	85	85	85	85	85	941·1	941·1	941·1	941·1	941·1	941·1	941·1	941·1	941·1		
						5	5	5	5	5	5	0	0	0	0	0	0	2·172	2·172	2·172	2·172	2·172	2·172	2·172	2·172	2·172		
						..	..	..	..	..	..	..	..	..	..	..	0	0	0	0	0	0	0	0	0			
																	5	5	5	5	5	5	5	5	5			
																	6	6	6	6	6	6	6	6	6			
																	12	12	12	12	12	12	12	12	12			
																	0	0	0	0	0	0	0	0	0			
																	1	1	1	1	1	1	1	1	1			

**VICKERS-ARMSTRONGS LIMITED—GUNS AND MOUNTINGS.**

		MACHINES AND AUTOMATIC GUNS.					
* .303-in. (7·7-mm.)	* .303-in. (7·7-mm.)	* .303-in. (7·7-mm.)	* .303-in. (7·7-mm.)	* .303-in. (12·7-mm.)	* .5-in. (12·7-mm.)	* .5-in. (12·7-mm.)	* .5-in. (12·7-mm.)
Observer's Pilot's Gun for Aircraft.	Land and Naval.	Observer's Gun for Aircraft.	Infantry.	Observer's Gun for Aircraft.	Aircraft and Land and Naval.	Aircraft and Land and Naval.	Aircraft and Land and Naval.
Vickers Recoil operated.	Vickers-Berthier Gas operated.	Vickers-Berthier Gas operated.	Vickers-Berthier Gas operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.	Vickers Recoil operated.
System.							
Diameter of Bore	ins.	.303	.303	.303	.5	.5	.5
do.	mm.	7.7	7.7	7.7	12.7	12.7	12.7
Length of Bore	cals.	93·7	93·7	72	50	62·2	72
Weight of Gun	lb.	26·5	32	20·5	45	52·5	101
do.	kg.	11·3	12	9·3	10	20·4	23·8
Weight of Projectile	grs.	174	174	174	174	565	565
do.	grms.	11·3	11·3	11·3	11·3	36·6	36·6
Muzzle Velocity	f.s.	2,400	2,440	2,400	2,450	2,550	3,000
do.	m.s.	732	744	732	746	777	914
Muzzle energy	f.t.	0·9	1	0·9	0·9	3·36	3·64
do.	m.t.	0·28	0·31	0·28	0·28	1·04	1·125
Rounds per minute		650-750	900-1000	500-600	900-1000	450-500	350-450
Weight of Mounting	lb.	..	..	5	..	..	..
do.	kg.	..	..	..	..	..	..
Angle of Elevation	°	..	..	90°	..	..	..
Angle of Depression	°	..	..	90°	..	..	..

\* This gun can be adapted to fire any pattern of rifle calibre cartridge.

## **BEARDMORE GUNS AND HOWITZERS.**

NAVAL.											
Calibre	Length of Bore	Weight of Gun	Weight of Projectile	Muzzle Velocity	Muzzle Energy	In.	mm.	cals.	tons	do.	do.
. . . . .	101·6	101·6	2,113·4	14·06	1·833	4	120	120	1,016	2,489	1,200
. . . . .	55	55	31·1	31·06	5·890	4·7	50	50	55	3,711	50
. . . . .	245	245	50	22·68	9·000	5·5	55	55	55	3,405	55
. . . . .	50	50	50	22·68	9·000	4·7	55	55	55	3,011	50
. . . . .	9·95	9·95	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	8·95	8·95	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	6·8	6·8	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	5·35	5·35	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	5·35	5·35	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	8·1	8·1	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	13·9	13·9	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	17·5	17·5	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	20·25	20·25	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	25	25	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	66	66	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	77	77	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	96	96	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	107	107	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	16	16	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	406	406	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	45	45	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	107	107	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	16	16	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	381	381	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	44	44	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	107	107	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	16	16	50	22·68	9·000	5·5	55	55	55	8128	50
. . . . .	16	16	50	22·68	9·000	4·7	55	55	55	8128	50
. . . . .	32,270	32,270	50	22·68	9·000	5·5	55	55	55	8128	50

ANTI-AIRCRAFT.						TANK GUNS.	
For Sub-marines.	Fixed.	Fixed.	Fixed.	Fixed.	Mobile.		
3.0	3.0	4.0	4.0	4.724	3.02	3.3	2.24
75	75	101.6	101.6	120	84	47	57
45	45	45	50	40	42.5	30.0	23
0.64	1.65	1.95	2.1	3.1	0.75	1.1	1.8 cwt.
648	675	1,981	2,133	3,150	762	1,120	284
16	16	31	31	48.5	17.6	21	6
7.26	7.26	14.06	14.06	22	8.0	9.58	2.72
2,100	2,590	2,800	2,850	2,560	2,175	2,300	1,525
640	780	792	860	780	663	701	465
151	744	1,453	1,740	2,205	577	770	967
	230	450	530	672	179	238	30

FIELD GUNS AND HOWITZERS.									
ANTI-TANK.					ANTI-TANK.				
Infantry Guns.					Gun.				
Calibre 1	2.24	3.3	3.3	4.5	6	8	9.2	8.3	8.3
Ins.	1.575	84	105	112	152	203	234	84	84
mm.	40	67	31	20	35	17	17	12.25	12.25
cals.	28.5	24	cwts.	15	13	1.7	1.7	wts.	wts.
cwts.	37	cwts.	cwts.	16	9	4.28	4.28	4.0	4.0
Length of Bore	0.92	7.25	8.0	9	9	1.15	3.7	4.25	4.25
Weight of Gun	1.03	46.7	406	194	458	3.759	3.048	4.318	4.318
Weight of Projectile	52.4	369	406	1168	1168	100	290	18.5	18.5
Weight of Projectiles	3.25	18.5	35.2	18.5	35	100	290	21.0	21.0
do.	2.0	6.0	8.39	8.39	36	100	290	8.36	8.36
do.	0.91	2.72	16	8.39	36	100	290	131.5	131.5
do.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.	kg.
do.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Muzzle Velocity	f.s.	2.000	700	1,820	1,850	1,100	1,280	1,500	1,640
do.	m.s.	609.6	213.4	655	655	336.3	381	457	517
Muzzle Energy	f.t.	55	20.4	425	444	155	288.6	3,120	4,524
do.	m.t.	17	6.3	131	138	48	1,083	3,911	138
S.A.	S.A.	S.A.	S.A.	S.A.	S.A.	90.9	335	1,211	1,401

In same carriage.

## FRENCH NAVAL ORDNANCE.

Date and Pattern of Gun.	Model 1902-06.	Model 1906-10.	Model 1910.	Model 1912.	Model 1919.	Model 1920.	Model 1923.	Model 1924.	Model 1927.	Model 1930.
Calibre . . . cms.	24	30·5	30·5	34	13	15·5	13·8	13	20·3	13·8
Calibre . . . ins.	9·45	12·01	12·01	5·43	18·4	5·12	6·1	5·43	5·12	5·43
Length . . . calib.	49·5	45	44·67	55	45	40	50	40	50	40
Total weight . . tons	28·8	53·23	58·16	5·22	65·23	4·32	8·73	4·05	8·81	20·39
Firing Charge, A.P.										
Projectile . . lbs.	147·05	287·7	277·8	23·68	384	17·05	43·21	17·86	103·12	17·86
A.P. Projectile . . lbs.	487·22	970·32	952·38	80·47	1222·44	70·44	124·07	87·98	70·44	271·61
Muzzle Velocity. f.s.	2,635	2,559	2,569	2,723	2,605	2,408	2,789	2,297	2,408	2,789
										87·98 kilograms. 54·17 kilograms. 870 metres second
										2,297 kilograms. 870 metres second

# ITALIAN NAVAL ORDNANCE.

*Corrected to November, 1932.*

Official Designation;	V.	A.	V.	A.	V.	A.	S.-An.	A.	An.	O.T.O.	A.	S.	A.	V.	S.	A.	S.	
Calibre mm., length cal.	254/45	254/45	254/45	254/45	203/53	203/50	190/45	152/53	152/50	152/45	120/50	120/50	102/45	100/47	102/35	76/50	76/45	76/40
Mark A. = Armstrong, V = Vickers, An. = Ausaldo.	{	{	{	{	{	{	{	{	{	{	{	{	{	{	{	{	{	
S. = Schneider.																		
Mark O.T.O. = Odero-Terni-Orlando																		
Date of introduction.	1909	1907	1906	1929	1924	1906	1927-29	1918	1911	1931	1909	1928-1931	1917	1929	1914-1915	1909	1911	1916
Designation by calibre, cm.	25·4	25·4	25·4	20·3	20·3	19·05	15·24	15·24	15·24	12·0	12·0	10·2	10·2	10·2	7·62	7·62	7·62	7·62
Calibre in inches	10	10	10	8	8	7·5	6	6	6	4·75	4·75	4	3·9	4	3	3	3	3
Total, in feet.	39·07	38·71	38·71	36·64	34·59	29·22	27·83	25·94	23·42	19·57	18·38	15·71	15·71	12·24	11·72	10·29	4·593	4·593
Rifled Bore, in inches	35·84	35·84	35·84	37·05	35·86	—	281·7	256·6	219·2	—	204·64	174·64	150·74	12·365	11·49	12·6	107·2	101·57
Powder Chamber in inches	74·91	74·91	74·91	64·56	64·56	—	51·65	44·6	44·6	—	28·64	35·03	27·16	3·112	23·50	22	25·4	—
Length (Bore in calibres)	37·3	35·84	37·05	—	—	37·5	—	42·77	36·54	—	43·31	36·96	37·53	15·371	28·46	42	35·73	—
No. of Grooves	60	70	52	52	44	44	36	36	36	36	36	36	40	26	32	28	25·8	24
Twist of Rifling, in calibres	30	30	30	30	0·30	30	33	33	33	30	30	30	—	30	30	35·9	33	22
Total Weight in tons	34·49	35·339	19·170	20·800	14·478	7·700	8·100	7·025	3·00	3·662	4·035	2·327	2·020	1·200	1·122	0·698	0·660	0·104
Armour-piercing projectile	185	185	111·994	103·19	70·987	43	—	—	—	—	—	—	—	—	—	—	—	—
Charge	185	185	—	—	70·987	—	32·79	30·64	—	14·66	9·589	9·479	10·319	6·50	3·02	3·571	2·281	0·529
Common Shell, H.E.	185	185	—	—	275·573	260	200·39	103·5	—	50·5	48·74	48·74	30·31	30·318	30·31	14·05	14·05	13·954
Armour-piercing projectile	49·4	49·4	49·4	489·8	489·8	—	498·5	—	—	—	—	—	—	—	—	—	—	—
Shell, H.E., lb.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Shrapnel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Armour-piercing projectile	4·37	4·37	—	—	—	2·332	—	5·996	5·928	—	2·711	2·711	2·866	—	2·866	—	—	—
Shell, H.E.	16·63	16·63	—	—	—	11·706	—	—	—	—	—	—	—	—	—	—	—	—
Shrapnel	53·13	53·13	29·86	29·86	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Muzzle Velocity in ft. sec.	2755·9	2758·77	2758·77	3051·180	2743·20	2788·77	2786	2854	2733	2786	2788	2438·40	2460	2460	2460	2460	2460	2214
Total tons per sq. inch	17·71	17·71	—	—	17·98	—	18·37	16·86	—	18·37	15·75	18·37	—	18·37	18·37	15·75	—	12·47

305/46 A.V. "Duilio and Cesare" class; 254/45 V. "S. Giorgio" class; 254/45 V. "Pisa"; 203/53 An. "Zara" class; 203/50 S.A.N. "Trento" class; 190/45 A.V. "S. Giorgio" and Pisa" class; 152/45 S. "Colleoni" class; 152/45 S. "Duilio" class; 120/50 An. "Vivaldi" class; 120/50 A.V. "Quarto" and "Cosaro"; 120/45 A.V. "Leone"; 100/47 O.T.O. "Trento, Zara and Colleoni" class.

JAPANESE NAVAL ORDNANCE

Date and Pattern of Gun.	K.M. (1)	V. (2)	A. (3)	V. (4)	A. (5)	V. (7)	A. (8)	Carried by
Design, by Calibre, in cms. . . . .	40·6	35·6	20·3	15·2	15·2	15·2	14	(1) Mutan Class.
Calibre, in inches . . . . .	16	14	8	6	6	6	5·5	(2) Ise Class.
Total length, in feet . . . . .	..	..	..	..	..	..	..	Fuso Class.
Length of Bore, in ins. . . . .	..	..	..	..	..	..	..	Kongo Class.
Length of Bore, in cms. . . . .	45	45	45	50	50	45	50	(4) Kongo.
Total weight, in tons . . . . .	..	83	17·3	8	8·7	8·5	7·5	(5) Fuso Class.
Weight of Firing Charge, Armour-piercing Projectile . . . . .	..	..	..	..	..	..	..	Kongo Class (ex- cept Kongo).
Weight of Armour-piercing Projectile 1b. . . . .	2190	1400	250	100	100	100	82	(6) Yalagi.
Weight Common Shell . . . . .	"	..	..	..	..	..	..	(8) Ise Class.
Muzzle Velocity, in f.s., A.P. Projectile . . . . .	2780	2526	2740	3000	3000	2130	3000	Mutan Class.
Muzzle Energy in foot-tons . . . . .	118,000	62,500	13,100	6300	6300	3165	6300	Kuma Class.
Perforation at Muzzle, <sup>†</sup> wrought iron, inches . . . . .	65	48·2	30·5	25·5	25·5	18·3	25·5	Tenryu Class.
Perforation Krupp Steel, 3000 yds. . . . .	$\left\{ \begin{array}{l} 13·8 \\ \text{at} \\ 10·970 \end{array} \right\}$ metres,			10·970	6·2	6·2	6·2	(9) Yodo.

† By Treissider's Formula.

## A. B. BOFORS—GUNS AND MOUNTINGS

Tables corrected by the Manufacturers, December, 1934.

### NAVAL GUNS AND MOUNTINGS.

System		25 mm.		40 mm.		57 mm.		75 mm.		76 mm. double		88 mm.		102 mm.		105 mm. double	
		Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore	mm.	25	40	57	75	75	75	88	102	105	105	105	105	105	105	105	105
Length of Barrel	mm.	64	43	60	49	60	49	45	50	40	45	45	45	45	45	45	45
Weight of Gun	kg.	75	165	220	340	615	1,195	1,665	2,430	1,180	2,430	1,180	2,430	1,180	2,430	1,180	2,430
” Projectile	kg.	0.250	0.955	2.72	6.5	6.5	6.5	14	14	16	16	16	16	16	16	16	16
Muzzle Velocity	m.s.	850	700	900	700	900	750	850	800	850	700	850	700	800	700	800	800
Range, max.	m.	5,500	7,800	8,500	11,000	11,800	14,300	16,000	18,300	14,600	18,200	14,600	18,200	14,600	18,200	14,600	18,200
Rounds per Minute	m.	180	120	120	30	30	28	50	20	15	14	14	14	14	14	14	14
Weight of Gun, Mounting, and Shield	kg.	500	850	1,850	1,050	1,410	1,775	8,300	3,550	7,590	2,950	2,950	2,950	2,950	2,950	2,950	2,950
Weight of Shield	kg.	—	—	—	—	240	—	—	—	—	—	—	—	—	—	—	—
Angle of Elevation	deg.	90	90	90	80	40	80	90	40	80	80	80	80	80	80	80	80
” Depression	deg.	10	10	10	10	10	10	5	10	10	10	10	10	10	10	10	10

### NAVAL GUNS AND MOUNTINGS—continued.

Diameter of Bore		12 cm.		12 cm.		12 cm. double		15 cm.		15 cm. double		20.3 cm. double		25.4 cm. double		28 cm. double	
		mm.	cal.	mm.	cal.	mm.	cal.	mm.	cal.	mm.	cal.	mm.	cal.	mm.	cal.	mm.	cal.
Diameter of Bore	mm.	120	120	120	120	120	120	149.1	149.1	149.1	149.1	203	203	254	254	283	283
Length of Barrel	mm.	45	50	60	60	45	50	50	50	50	50	50	50	45	45	45	45
Weight of Gun	kg.	2,600	4,100	4,100	4,100	6,100	7,865	7,500	7,500	22,500	22,500	37,900	37,900	44,100	44,100	44,100	44,100
” Projectile	kg.	21	24	24	24	46	46	46	46	115	115	225	225	305	305	305	305
Muzzle Velocity	m.s.	800	900	900	900	835	900	900	900	900	900	850	850	870	870	870	870
Range, max.	m.	19,300	19,500	19,500	19,600	24,500	24,500	24,500	24,500	28,000	28,000	30,300	30,300	25,000	25,000	25,000	25,000
Rounds per Minute	m.	12	10	18	8	7	15	15	12	8	12	8	8	6	6	6	6
Weight of Gun, Mounting, and Shield	kg.	8,200	10,000	20,000	17,860	28,300	72,000	170,000	170,000	320,000	320,000	494,000	494,000	494,000	494,000	494,000	494,000
Weight of Shield	kg.	800	1,500	1,600	4,550	12,000	60	60	60	24,200	24,200	114,000	114,000	225,000	225,000	225,000	225,000
Angle of Elevation	deg.	45	30	30	30	10	10	10	10	10	10	5	5	45	45	45	45
” Depression	deg.	10	10	10	10	10	10	5	10	10	10	5	5	10	10	10	5

**A.B. BOFORS—GUNS AND MOUNTINGS. Howitzers and Field Guns.**

	75 mm. Field.	75 mm. Field.	105 cm. Field Howr.	105 cm. Field.	15 cm. Field.	21 cm. Field Howr.
Diameter of Bore	mm.	75	105	149.1	216	
Length of Barrel	cal.	40	22	43	14	
Weight of Gun	kg.	365	495	1,825	2,780	
" Projectile	kg.	6.5	6.5	41	100	
Muzzle Velocity	m.s.	625	710	800	580	
Range, max.	m.	12,500	14,000	17,000	22,000	
Rounds per Minute		25	10,500	12	4	13,000
Weight of Gun, Mounting and Shield	kg.	1,350	1,650	3,650	5,400	3
Angle of Elevation	deg.	45	45	45	45	7,800
" Depression	deg.	5	5	3	5	70
						6

	Tank Guns.	37-81 mm.	37-81 mm.	47 mm. Barrel.	47 mm. Barrel.	47-75 mm.	47-75 mm.	Infantry Guns.	37 mm.	37 mm.	75 mm.	75 mm.	Mountain Howitzers.
Diameter of Bore	mm.	37	47	81	47	75	75		37	37	75	75	105 mm.
Length of Barrel	cal.	45	45	20	33	20	45		45	45	22	22	
Weight of Gun	kg.	105	105	144	130	130	103		103	103	256	256	
" Projectile	kg.	0.7	1.5	4.4	1.5	4.5	0.7		0.7	0.7	6.5	6.5	
Muzzle Velocity	m.s.	800	560	800	560	320	300		800	800	470	470	
Range, max.	m.	6,400	5,400	7,100	6,000	6,500	5,400		6,400	6,400	10,000	10,000	
Rounds per Minute		30	30	25	20	25	20		30	30	25	25	
Weight of Gun, Mounting and Shield	kg.	300	300	450	80	425	60		335	335	790	790	
Angle of Elevation	deg.	25	25	10	8	10	5		25	25	50	50	
" Depression	deg.	10	10						10	10	10	10	

A.B. BOFORS—GUNS AND MOUNTINGS. Anti-Aircraft Guns.

	25 mm. Fixed.	25 mm. Mobile.	40 mm. Fixed.	40 mm. Mobile.	75 mm. Mobile.	75 mm. Fixed.	80 mm. Mobile.	102 mm. Fixed.	105 mm. Mobile.
System . . . . .	Auto.	Auto.	Auto.	Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.	Semi-Auto.
Diameter of Bore . . . . .	25	25	40	40	75	75	80	102	105
Length of Barrel . . . . .	64	64	60	60	60	60	50	50	44
Weight of Projectile . . . . .	0.250	0.250	0.955	0.955	6.5	6.5	14	14	16
Muzzle Velocity . . . . .	850	900	900	900	750	850	850	850	750
Rounds Per Minute . . . . .	180	180	120	120	30	25	25	15	12
Weight of Gun and Mounting . . . . .	500	1,020	1,550	1,700	2,600	3,400	3,000	7,000	6,200
Angle of Elevation . . . . .	90	90	90	90	85	85	85	85	85
," Depression . . . . .	10	5	10	5	3	5	3	5	5

**BETHLEHEM STEEL CO.**  
**SHIP AND COAST-DEFENCE GUNS.**

Calibre.	Length of bore. inches.	Weight of gun, including breech mechanism. lbs.	Weight of projectile. lbs.	Velocity. ft. per sec.	Energy. foot-tones.	At Muzzle.		Type of Ammunition. Fixed in cartridge case. Separate, with powder in bag. Separate, with cartridge case. Separate, with powder in bag.
						metres per sec.	metre-tones. metres. inches.	
1·457	37	50	160	1·07	655	34	2·04	51·8
1·850	47	50	249·5	3·3	732	41	4·11	104·4
2·244	57	50	960	6·07	2,400	75	5·17	131·8
3	76	50	1950	13	2,700	823	204	195·8
4	102	50	2·6	2,642	33	15	2,800	557
4	102	50	2·6	2,642	30	86	14	557
5	127	51	5·0	5,080	50	22·7	3,150	597
6	152	45	7·0	7,112	105	47·6	2,600	1,067
6	152	50	8·4	8,534	105	47·6	2,800	960
6	152	53	10·1	10,260	105	47·6	2,800	960
7	178	45	12·7	12,900	165	74·8	2,710	923
7	178	50	14·5	14,730	165	74·8	2,900	884
8	203	45	18·6	18,900	260	118	2,800	853
8	203	50	22·3	22,660	260	118	2,900	884
9·2	234	50	30·4	30,890	380	172	2,900	884
10	254	45	35·4	35,970	515	234	2,800	853
10	254	50	43·9	44,600	515	234	2,900	884
12	305	45	53·8	54,660	870	395	2,800	853
12	305	50	57·5	58,400	870	395	2,900	884
14	356	45	64·6	65,650	1,400	635	2,600	792
14	356	50	79·4	80,700	1,400	635	2,800	853
15	381	45	86·5	87,880	1,700	771	2,600	792
16	406	45	105·0	106,500	2,100	953	2,600	792
16	406	50	128·0	130,200	2,100	953	2,800	823
16	406	50	140·0	142,400	2,330	1,057	2,700	823
18	457	45	150·0	152,400	3,330	1,510	2,430	747

Guns of 4·7-in. calibre and under, equipped with the wedge-type breech mechanism, are supplied with an automatic breech-opening device, if desired.

# UNITED STATES NAVAL ORDNANCE.

GUN.	MARK.	Length in Calibres.	Total Length in Inches.	Capacity of Chamber in Cubic Inches.	Trav'd of Projectile in Inches.	Weight of Gun.	Weight of Projectile.	Muzzle Velocity.	Muzzle Energy.	ft.-tons.	inches.
3-in. S.A.	V.	50	159	219	128.8	1.0	1.8	8.85	2700	658	3.3
4-in. R.F.G.	III., IV., V., VI.	40	164	331	134.5	1.5	3.3	4.85	2000	915	3.4
4-in. R.F.G.	VII.	50	205	652	168.3	2.6	3.3	9.0	2500	1,430	4.6
4-in. R.F.G.	VIII.†	50	205	652	168.3	2.9	3.3	12.3	2800	1,794	5.3
5-in. R.F.G.	II., III., IV.	40	206	656	167.8	8.1	50	10.0	2300	1,845	5.3
5-in. B.L.R.	V., VI.	50	256	1,200	215.6	4.6	60	19.2	2700	3,032	6.2
5-in. B.L.R.	VI.	50	256	1,200	215.6	4.6	50	20.5	3000	3,122	6.4
5-in. R.F.G.	VII.†	51	261	1,185	215.6	5.0	50	23.8	3150	3,439	6.8
6-in. R.F.G.	II., III., IV.	30	196	1,318	145.4	4.8	105	18.8	1950	2,768	5.3
6-in. R.F.G.	IV., VII.	40	256	1,320	205.8	6.0	105	18.8	2150	3,365	6.0
6-in. R.F.G.	IX.	45	270	1,320	221.7	7.0	105	18.8	2250	3,685	6.3
6-in. B.L.R.	VI.	50	300	2,101	247.5	8.3	105	30.0	2400	4,920	8.0
6-in. B.L.R.	VIII.	50	300	2,101	247.5	8.6	105	37.0	2800	5,707	8.3
7-in. B.L.R.	II., III., IV.	45	323	3,643	239.8	12.7	165	58.0	2700	8,338	9.6
8-in. B.L.R.	V.	35	305	3,170	245.8	13.1	260	43.8	2100	7,948	8.6
8-in. B.L.R.	VI.	40	343	5,243	233.1	18.1	260	78.0	2300	11,264	10.6
8-in. B.L.R.	VII.	45	369	5,243	299.5	18.7	260	98.5	2750	13,360	12.0
10-in. B.L.R.	I., II.	30	329	6,779	231.1	25.1	510	90.0	2000	14,141	10.7
10-in. B.L.R.	III.	40	413	10,222	827.0	34.6	510	207.5	2700	25,772	15.6
12-in. B.L.R.	II., III., IV.	35	441	11,391	345.2	45.3	870	160.0	2100	26,596	14.2
12-in. B.L.R.	V.	40	493	17,096	892.2	52.1	870	227.5	2400	31,738	16.8
12-in. B.L.R.	III., IV.	40	493	17,096	892.2	52.1	870	305.0	2600	40,768	18.5
12-in. B.L.R.	V.	45	553	16,974	452.0	52.9	870	305.0	2700	43,964	19.4
12-in. B.L.R.	VI.	45	553	14,970	432.0	53.6	870	340.0	2850	48,984	20.8
12-in. B.L.R.	VII.	50	607	14,296	506.3	56.1	870	340.0	2950	52,483	21.7
13-in. B.L.R.	I., II.	35	479	15,068	874.9	61.4	1130	180.0	2000	31,333	15.0
14-in. B.L.R.	I.	45	642	..	..	63.6	1400	365.0	2600	65,606	39.7*
14-in. B.L.R.	II.	50	700	..	..	82.2	1400	..	2800	76,180	44.1
16-in. B.L.R.	..	45	..	..	..	105.0	2100	2006	98,500	45.95	..
16-in. B.L.R.	..	50	..	..	..	130.0	2100	2800	114,270	51.08	..

\* De Marre formula.

† All battleships from the Delaware class onward have this gun for torpedo defence.

† There is now a 4-in. 50-cal. anti-aircraft gun.

The U.S. Navy has a 5-in. 25-calibre A.A. gun; a 6-in. 58-calibre gun; and an 8-in. 55-calibre gun, but complete details are not yet published.

MERCHANT SHIPPING  
REFERENCE SECTION.



BRITISH AND IRISH MERCHANT TONNAGE, AND UNITED STATES  
SEA-GOING MERCHANT TONNAGE, AS COMPARED WITH THE  
WORLD'S TOTAL MERCHANT FLEET.

Year.	World.	Great Britain and Ireland.	Percentage of British and Irish Tonnage to Total.	United States.*	Percentage of United States Tonnage to Total.
1890	21,118,528	10,241,856	48·5	†	—
1891	22,912,753	10,585,747	46·2	†	—
1892	23,672,698	11,157,662	47·1	1,926,426	8·1
1893	24,286,865	11,563,997	47·7	1,964,359	8·1
1894	24,547,597	11,807,010	48·1	2,171,459	8·8
1895	25,086,199	12,117,957	48·3	2,164,753	8·6
1896	25,598,186	12,293,589	48·0	2,284,725	8·7
1897	25,889,044	12,403,409	47·9	2,326,898	9·0
1898	26,548,360	12,587,904	47·4	2,448,677	9·2
1899	27,613,851	12,926,924	46·8	1,872,245	6·8
1900	28,957,358	13,241,446	45·7	2,035,062	7·0
1901	30,479,971	13,656,161	44·8	2,281,925	7·3
1902	32,302,412	14,491,072	44·7	2,342,913	7·3
1903	33,501,855	14,889,571	44·4	2,480,981	7·4
1904	34,786,182	15,391,950	44·2	2,590,849	7·4
1905	35,998,180	15,808,180	43·9	2,649,411	7·4
1906	37,550,477	16,381,350	43·6	2,672,042	7·1
1907	39,435,788	16,999,668	43·1	2,728,711	6·9
1908	40,920,551	17,818,351	42·3	2,802,387	6·8
1909	41,447,825	17,377,936	41·9	2,791,282	6·7
1910	41,912,520	17,516,479	41·8	2,761,605	6·6
1911	43,144,909	17,872,697	41·4	2,808,684	6·5
1912	44,600,677	18,213,620	40·8	2,848,829	6·4
1913	46,970,113	18,696,287	39·8	2,998,457	6·4
1914	49,089,552	19,256,766	39·2	2,970,284	6·0
1915	49,261,769	19,541,968	39·7	3,522,933	7·1
1916	48,688,136	19,194,857	39·3	3,790,578	7·8
1917†	—	—	—	—	—
1919	50,919,273	16,555,471	32·5	10,782,170	21·2
1920	57,314,065	18,390,424	32·0	13,789,874	24·0
1921	61,974,658	19,571,554	31·6	14,697,088	28·7
1922	64,370,786	19,295,637	30·0	14,788,506	22·9
1923	65,166,298	19,281,549	29·6	14,597,085	22·4
1924	64,028,567	19,105,838	29·8	13,580,544	21·1
1925	64,641,418	19,440,711	30·1	12,948,632	20·0
1926	64,784,370	19,399,797	29·9	12,364,668	19·1
1927	65,192,910	19,309,022	29·6	12,070,050	18·5
1928	66,954,659	19,875,350	29·6	11,997,441	17·9
1929	68,074,312	20,166,931	29·6	11,835,176	17·4
1930	69,607,644	20,438,444	29·4	11,888,367	16·4
1931	70,131,040	20,802,905	28·9	10,998,606	15·7
1932	69,734,810	19,671,675	28·2	10,889,419	15·6
1933	67,920,185	18,700,739	27·5	10,692,798	15·7
1934	65,576,612	17,731,912	27·0	10,354,674	15·8

\* Excluding American Great Lakes vessels.

† Figures not available.

Note — Prior to 1919 the tonnages shown are the totals of gross tonnage for steam and motor vessels, and net tonnage for sailing vessels; in 1919 and subsequent years the figures are given in gross tonnage throughout.

NUMBER AND GROSS TONNAGE OF THE VESSELS OF 100 TONS  
TO EACH OF THE SEVERAL COUNTRIES OF THE

Flag.	June, 1913.†		June, 1919.		June, 1922.	
	No.	Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.
Gt. Britain and Ireland	9,214	18,696,297	7,964	16,555,471	8,849	19,295,637
British Dominions . .	2,073	1,795,806	2,141	2,052,404	2,472	2,746,883
British Empire . .	11,287	20,481,548	10,105	18,607,875	11,821	22,042,520
United States of America	2,696	2,998,457	4,850	10,782,170	4,886	14,738,506
Sea . .	627	2,382,690	506	2,257,786	495	2,247,690
Lakes . .						
Philippine Islands . .	77	46,489	78	51,817	99	76,264
Total . .	8,400	5,427,636	4,929	13,091,773	5,480	17,062,460
Argentina . . . .	808	214,835	215	154,441	216	181,555
Austria-Hungary . . .	427	1,011,414	389	714,617	—	—
Belgium . . . .	172	804,886	152	818,276	275	579,477
Brazil . . . .	459	929,637	428	512,675	399	492,571
Chile . . . .	131	189,792	114	101,647	126	181,401
China . . . .	66	86,690	102	132,515	184	188,388
Cuba . . . .	59	61,586	51	47,295	65	62,677
Denmark . . . .	811	762,054	645	702,496	822	1,038,188
Estonia . . . .	—	—	—	—	98	45,259
Finland . . . .	—	—	388	180,962	862	218,671
France . . . .	1,852	2,201,164	1,440	2,293,681	2,094	3,845,792
Germany . . . .	2,821	5,082,061	1,768	3,503,880	1,728	1,887,408
Greece . . . .	442	722,782	312	928,796	379	668,127
Holland . . . .	759	1,809,849	981	1,591,911	1,164	2,632,713
Italy . . . .	1,114	1,521,942	858	1,370,097	1,413	2,866,935
Japan * . . . .	1,037	1,500,014	1,418	2,325,266	2,026	3,586,918
Jugo-Slavia . . . .	—	—	‡	‡	‡	‡
Latvia . . . .	—	—	—	—	67	40,124
Norway . . . .	2,191	2,457,890	1,629	1,857,829	1,852	2,600,861
Peru . . . .	60	45,514	68	79,342	74	101,209
Portugal . . . .	208	120,579	227	261,212	286	285,878
Roumania . . . .	88	45,408	35	68,792	31	72,297
Russia . . . .	1,216	974,178	618	541,005	—	—
Spain . . . .	607	840,995	576	750,611	978	1,282,757
Sweden . . . .	1,436	1,047,270	1,268	992,611	1,345	1,115,975
Turkey . . . .	272	157,298	161	116,249	—	—
Other Countries and flag not recorded . .	158	98,115	495	304,530	1,167	1,270,564
Total . . . .	80,591	46,970,118	29,255	50,919,278	38,985	64,870,786

\* Japanese sailing vessels are not recorded in Lloyd's Register Book.

† In 1913 the figure shown is the total of the gross tonnage of steam and motor vessels, and the net tonnage of sailing vessels; in 1919 and subsequent years the figure is given in gross tons throughout.

‡ Figures included in total for "Other countries."

GROSS AND UPWARDS (STEAM, SAIL, AND MOTOR) BELONGING  
WORLD, AS RECORDED IN LLOYD'S REGISTER.

June, 1926.		June, 1928.		June, 1932.		June, 1934.	
No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No..	Gross Tonnage.
8,369	19,899,797	8,172	20,166,831	7,971	19,671,675	7,469	17,734,912
2,477	2,870,327	2,507	2,949,816	2,547	3,112,708	2,498	3,106,806
10,864	22,270,124	10,679	23,116,147	10,518	22,784,383	9,967	20,841,218
4,001	12,364,668	8,696	11,835,176	8,252	10,889,419	8,045	10,354,674
529	2,433,049	576	2,541,938	574	2,552,582	583	2,611,040
97	81,044	111	104,908	120	104,669	111	79,823
4,627	14,878,761	4,383	14,482,022	3,946	13,546,620	3,739	13,045,037
242	234,848	311	296,236	345	336,771	344	340,195
—	—	—	—	—	—	—	—
225	507,473	244	529,048	240	537,442	198	414,655
351	482,908	391	560,680	309	496,130	308	499,389
138	179,712	119	154,563	111	178,680	101	157,048
201	299,806	218	319,224	250	371,153	253	398,062
72	61,735	66	45,270	61	44,016	58	39,510
771	1,081,146	701	1,055,867	730	1,180,620	700	1,104,397
115	49,025	116	60,388	146	106,017	148	121,329
363	232,792	348	298,323	324	332,385	379	469,486
1,769	3,490,606	1,662	3,378,663	1,644	3,557,006	1,567	3,298,053
1,986	8,110,918	2,127	4,092,552	2,151	4,164,842	2,043	3,690,990
467	924,944	516	1,266,685	551	1,470,064	550	1,507,260
1,109	2,564,904	1,339	2,939,067	1,445	2,963,840	1,426	2,618,016
1,401	3,240,630	1,380	3,284,660	1,323	3,390,572	1,242	2,928,396
2,087	3,967,617	2,059	4,186,652	1,964	4,255,014	1,949	4,072,707
137	195,787	153	281,396	185	381,045	174	356,831
87	67,783	108	150,159	114	188,479	110	192,597
1,844	2,841,905	1,807	3,224,493	2,008	4,166,839	1,908	3,981,354
46	79,068	38	62,160	39	64,686	35	49,476
285	280,116	269	246,368	259	269,013	262	263,171
37	68,173	34	68,647	33	74,104	34	91,743
370	323,294	379	440,506	449	685,144	491	942,259
924	1,169,008	877	1,161,591	861	1,265,321	840	1,177,627
1,380	1,338,089	1,385	1,510,125	1,483	1,715,984	1,839	1,608,872
174	186,796	189	172,096	189	178,058	183	192,688
468	637,799	584	690,784	619	1,030,087	654	1,174,301
32,615	64,784,370	32,482	68,074,312	32,247	69,734,310	30,997	65,576,612

• Japanese sailing vessels are not recorded in Lloyd's Register Book.  
† Figures included in total for "Other Countries."

NUMBERS OF STEAMERS AND MOTORSHIPS OWNED BY THE  
PRINCIPAL MARITIME COUNTRIES ON JUNE 30, 1934, BY  
DIVISIONS OF AGE.

Country.	Numbers of Vessels owned of Various Ages.						Total Number of Vessels owned.	Percentage of Total Number of Ships under 5 years old.
	Under 5 years.	5 years and under 10 years.	10 years and under 15 years.	15 years and under 20 years.	20 years and under 25 years.	25 years and over.		
Gt. Brit. & Ireland	654	1,212	1,252	1,814	951	1,724	7,107	9·2
British Dominions	158	425	314	281	315	680	2,173	7·3
United States *	101	120	667	966	205	501	2,560	3·9
Denmark . . .	86	68	192	98	59	188	686	12·5
France . . .	151	106	336	245	209	412	1,459	10·3
Germany . . .	163	322	574	207	242	584	2,082	7·5
Holland . . .	191	279	290	286	168	258	1,407	13·6
Italy . . .	55	119	194	152	189	372	1,091	5·3
Japan . . .	208	209	361	599	158	419	1,949	10·7
Norway . . .	237	279	307	339	214	538	1,904	11·9
Spain . . .	89	66	129	156	87	311	782	10·6
Sweden . . .	60	72	166	172	117	728	1,309	4·6
Other Countries .	292	829	372	534	563	1,926	4,016	7·3
World Total *	2,419	3,606	5,098	5,349	3,372	8,576	28,415	8·5

\* Excluding American Great Lakes vessels.

NUMBERS OF STEAMERS AND MOTORSHIPS OWNED BY THE PRINCIPAL MARITIME COUNTRIES ON JUNE 30, 1934, BY DIVISIONS OF GROSS TONNAGE.

Country.	Numbers of Vessels Owned of Various Gross Tonnages.										Total Number of Vessels owned.	Percentage of Total Number of Vessels of 6000 gross tons and over.
	100 tons and under 500 tons.	500 tons and under 1000 tons.	1000 tons and under 2000 tons.	2000 tons and under 4000 tons.	4000 tons and under 6000 tons.	6000 tons and under 8000 tons.	8000 tons and under 10,000 tons.	10,000 tons and under 15,000 tons.	15,000 tons and under 20,000 tons.	20,000 tons and over.		
Gt. Brit. & Ireland	3,290	649	633	586	1,057	507	179	128	51	33	7,107	12·6
British Dominions	1,061	292	380	257	106	42	18	13	2	2	2,173	3·5
United States *	595	187	170	430	629	428	109	43	12	7	2,560	23·4
Denmark . . .	225	83	219	88	41	18	18	4	—	—	686	4·4
France . . .	695	104	145	217	158	54	48	26	6	6	1,459	9·6
Germany . . .	1,048	262	227	178	124	114	47	18	5	9	2,082	9·5
Holland . . .	814	62	124	164	84	91	46	18	7	2	1,407	11·3
Italy . . .	362	101	116	143	192	75	19	9	4	10	1,031	11·3
Japan . . .	820	193	217	317	238	107	39	15	3	—	1,949	8·4
Norway . . .	718	194	391	192	216	137	43	11	2	—	1,904	10·1
Spain . . .	404	69	73	164	44	18	8	7	—	—	782	3·6
Sweden . . .	606	159	350	103	62	13	10	2	3	1	1,309	2·2
Other Countries .	1,470	559	653	778	433	70	34	19	—	—	4,016	3·0
World Total *	12,108	2,858	3,698	3,617	3,884	1,669	608	308	95	70	28,415	9·7

\* Excluding American Great Lakes vessels.

NUMBER AND TONNAGE OF MOTORSHIPS (EXCLUDING VESSELS FITTED WITH AUXILIARY MOTORS) OWNED BY VARIOUS NATIONS.

	June, 1923.			June, 1927.			June, 1930.			June, 1932.			June, 1934.		
	No.	Gross tonnage.	No.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Gt. Brit. & Ireland	139	374,873	201	1,167,301	453	2,246,166	511	2,609,554	520	2,601,386	561	2,703,569	561	2,703,569	
British Dominions	44	14,084	100	94,959	167	174,939	221	195,038	241	212,612	253	215,677	253	215,677	
United States *	97	139,786	188	349,786	258	600,453	288	681,590	288	679,465	285	673,721	285	673,721	
Denmark	40	132,542	68	219,246	89	341,509	117	426,607	122	441,915	124	438,518	124	438,518	
France	34	27,938	26	34,377	46	139,156	72	194,982	97	234,803	110	240,382	110	240,382	
Germany	45	84,528	112	915,141	183	537,261	211	591,158	217	618,248	246	617,988	246	617,988	
Holland	52	66,577	85	192,807	272	584,373	400	715,827	418	702,373	461	761,790	461	761,790	
Italy	34	61,374	64	363,892	112	494,709	131	515,914	136	584,868	142	596,576	142	596,576	
Japan	20	4,375	73	99,280	157	385,097	220	548,976	279	581,915	301	580,572	301	580,572	
Norway	130	177,071	197	580,551	292	1,279,847	366	1,798,572	867	1,744,890	875	1,759,446	875	1,759,446	
Spain	8	13,378	25	45,927	47	117,940	66	209,807	78	212,748	79	214,797	79	214,797	
Sweden	103	173,697	119	295,646	143	459,099	151	526,719	151	532,566	150	536,908	150	536,908	
Other countries	73	46,688	120	207,718	244	472,960	336	716,903	860	751,359	389	822,267	389	822,267	
World's total *		819,1315,931	1,468	8,966,571	2,463	7,783,559	3,090	9,730,517	3,264	9,889,356	3,476	10,281,151	3,476	10,281,151	

\* Excluding American Great Lakes vessels.

STEAMSHIP AND MOTORSHIP TONNAGE (INCLUDING AUXILIARIES)  
OWNED BY VARIOUS COUNTRIES, AS AT JUNE, 1934

Country.	Steamships.			Motorships.		
	No.	Gross tonnage.	Percentage of total steamship and motor-ship tonnage.	No.	Gross tonnage.	Percentage of total steamship and motor-ship tonnage.
Gt. Britain and Ireland	6,475	14,912,865	84·6	632	2,716,683	15·4
British Dominions .	1,828	2,740,764	92·0	345	237,156	8·0
British Empire .	8,303	17,653,629	85·7	977	2,953,839	14·3
United States * .	2,256	9,113,428	93·0	304	681,698	7·0
Denmark . . .	475	646,663	58·7	211	455,115	41·3
France . . .	1,311	3,010,528	92·4	148	249,066	7·6
Germany . . .	1,470	3,008,883	81·8	562	671,470	18·2
Holland . . .	806	1,831,287	70·1	601	781,090	29·9
Italy . . .	800	2,253,025	78·4	231	622,158	21·6
Japan . . .	1,478	3,365,132	82·6	471	707,575	17·4
Norway . . .	1,480	2,182,086	54·8	424	1,798,015	45·2
Spain . . .	650	940,954	80·8	132	223,535	19·2
Sweden . . .	979	1,041,760	65·2	330	555,554	34·8
Other countries .	3,478	6,232,485	87·7	538	872,047	12·3
World's Total* .	23,486	51,278,860	83·0	4,929	10,571,162	17·0

\* Excluding American Great Lakes vessels.

NUMBER AND GROSS TONNAGE OF MOTORSHIPS OF OVER 8,000 TONS  
GROSS, OWNED BY VARIOUS NATIONS, AS AT JUNE, 1934.

Country.	8,000 and under 10,000 tons gross.		10,000 and under 15,000 tons gross.		15,000 tons gross and above.		Total over 8,000 tons gross.	
	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.	No.	Gross tonnage.
Great Britain and Ireland . . .	63	552,440	26	298,557	13	261,352	102	1,112,349
British Dominions.	5	44,757	5	57,373	—	—	10	102,130
United States . .	23	203,651	6	66,008	—	—	29	269,669
Denmark . . .	10	86,289	3	30,851	—	—	13	117,140
France . . .	3	27,927	5	58,544	3	59,489	11	145,960
Germany . . .	5	45,159	8	101,147	2	33,431	15	179,737
Holland. . .	29	249,326	5	54,022	5	87,833	39	391,181
Italy . . .	7	62,154	4	48,628	5	117,310	16	228,092
Japan . . .	15	135,659	5	58,719	3	51,448	23	245,826
Norway . . .	40	358,714	2	24,406	—	—	42	383,120
Russia . . .	2	16,456	—	—	—	—	2	16,456
Spain . . .	—	—	3	36,732	—	—	3	36,732
Sweden . . .	10	88,860	1	10,409	4	68,879	15	168,148
Other countries .	16	142,720	12	146,116	—	—	28	288,836
World's Total .	228	2,014,112	85	991,512	35	679,742	348	3,685,366

## NUMBER AND TONNAGE OF TANKERS OWNED BY VARIOUS NATIONS. 323

 NUMBER AND TONNAGE OF TANKERS OWNED BY VARIOUS NATIONS.\*  

	June, 1923.			June, 1925.			June, 1927.			June, 1929.			June, 1932.			June, 1934.		
	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.	No.	Tons gross.
Great Britain and Ireland	312	1,691,257	315	1,708,978	352	1,934,186	388	2,165,208	393	2,316,425	369	2,211,720						
British Dominions	39	106,639	34	185,836	34	181,041	39	227,969	49	267,129	64	318,179						
British Empire			361	1,887,896	349	1,894,814	386	2,115,227	427	2,393,177	442	2,583,554	423	2,529,899				
United States			399	2,497,625	374	2,281,324	374	2,293,539	381	2,374,358	393	2,518,544	385	2,480,155				
Belgium			7	36,471	7	34,982	6	39,533	8	46,305	9	60,348	9	60,348				
Denmark			2	11,561	2	9,647	3	12,660	9	69,476	12	84,450	13	92,541				
France			19	105,233	28	151,089	27	146,872	29	169,298	38	221,300	41	240,593				
Germany			9	36,675	12	65,754	20	94,258	26	125,387	29	136,977	31	133,612				
Holland			35	115,804	46	148,109	58	199,110	74	261,255	79	334,604	71	313,185				
Italy			18	89,399	28	128,904	45	206,871	67	255,020	77	367,021	65	314,989				
Japan			10	64,036	8	47,137	9	47,531	13	76,911	20	122,337	20	134,250				
Norway			33	178,368	42	243,656	63	403,812	117	781,575	217	1,639,348	213	1,566,887				
Spain			8	30,604	8	30,648	8	30,602	8	30,602	16	77,880	17	80,288				
Sweden			2	6,599	2	4,873	3	16,270	7	49,127	17	141,369	16	130,247				
Other countries			24	100,652	33	146,894	48	241,801	80	365,432	110	621,089	116	661,533				
World's Total			917	5,160,923	939	5,177,630	1,050	5,847,086	1,236	6,987,922	1,458	8,808,821	1,420	8,668,477				

\* Excluding Tankers of less than 1,000 tons gross.

NUMBER AND TONNAGE OF MERCHANT VESSELS LAUNCHED.\*

	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	
Gt. Britain and Ireland	688	1,932,153	612	1,620,442	222	645,651	342	1,084,638	489	1,522,623	117	254,215		
British Dominions	77	26,744	235	293,495	41	37,072	47	32,220	47	21,827	9	6,094		
United States †	182	228,282	652	3,579,826	69	96,491	94	78,766	59	100,682	20	24,698		
Denmark	31	40,982	46	37,766	24	49,479	21	78,268	34	111,496	18	49,908		
France	89	176,095	34	38,633	27	96,644	35	75,569	16	81,607	8	6,875		
Germany	162	465,226	No returns.	109	345,062	121	406,874	85	249,077	35	19,097			
Holland	95	104,296	100	187,086	35	65,632	47	78,823	77	186,517	10	18,698		
Italy	38	50,856	32	82,713	21	66,523	31	142,046	82	71,497	8	12,070		
Japan	152	64,664	138	611,883	44	72,475	23	55,784	40	164,457	38	76,622		
Norway	74	50,687	82	57,578	48	42,619	48	28,805	51	39,604	7	11,623		
Spain	12	8,488	41	52,639	7	4,488	1	1,127	8	37,023	7	17,251		
Sweden	25	18,524	53	50,971	10	20,118	17	53,760	29	107,246	10	39,466		
Other Countries	88	96,724	96	26,775	27	20,410	17	19,371	38	62,859	6	5,745		
World's Total	1713	3,282,071	2556	6,588,757	684	1,662,664	844	2,129,536	1005	2,755,985	283	542,291		

\* Figures given include all steamers, motorships, and sailing vessels of 100 gross tons and upwards.

† Excluding vessels built at ports on the Great Lakes of America.

MERCHANT VESSELS UNDER CONSTRUCTION.\*

	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.	No.	Gross Tonnage.
	1913.	1919.	1925.	1929.	1933.	1934.						
Gt. Britain and Ireland	508	1,937,254	781	2,816,773	257	1,009,155	841	1,448,855	87	303,762	129	604,286
British Dominions	67	96,923	151	254,632	28	39,047	92	33,973	3	5,880	6	4,124
United States †	60	121,304	641	3,161,714	36	69,866	26	96,010	9	14,654	9	22,225
Denmark	11	25,257	45	68,074	18	70,760	19	80,855	9	31,970	15	74,988
France	42	249,595	64	174,736	36	150,220	19	135,776	27	95,888	10	120,868
Germany	92	535,555	No returns	73	306,636	66	295,499	7	80,300	38	120,816	
Holland	50	128,730	113	288,042	44	127,775	55	234,029	12	40,862	17	70,735
Italy	19	56,126	108	285,928	40	269,802	36	69,884	4	27,076	4	97,970
Japan	17	64,905	64	299,600	13	58,270	23	186,810	15	85,570	42	149,760
Norway	45	41,746	73	83,941	22	19,770	25	92,970	6	11,310	8	18,115
Spain	4	2,880	26	.90,705	5	11,427	13	46,137	13	31,924	6	17,890
Sweden	13	16,665	64	101,217	20	71,580	91	111,427	14	71,440	14	64,565
Other Countries	22	89,036	49	60,353	22	14,607	16	19,191	10	6,216	3	5,095
World's Total	968	3,368,054	2179	7,685,715	609	2,206,905	739	2,801,839	216	756,752	296	1,311,987

\* The figures give the number and aggregate gross tonnage of steamers, motorships, and sailing vessels under construction on September 30 of each year.

† Excluding vessels building at ports on the Great Lakes of America.

## ANNUAL MERCHANT SHIPPING LOSSES OF THE WORLD.\*

	1913.			1919.			1924.			1929.			1932.			1933.		
No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	No.	Tonnage.	% of Tonnage owned.	
Gt. Brit. & Ireland	113	199,453	1.07	99	151,653	.92	74	111,207	.68	61	118,420	.56	51	59,326	.30	55	72,684	.39
British Dominions	37	20,091	1.16	89	52,539	2.55	61	41,325	1.49	50	41,253	1.40	32	38,566	1.08	32	9,582	.31
United States †	91	71,469	2.38	115	150,272	1.15	64	87,418	.65	44	78,103	.66	30	43,308	.40	30	39,147	.37
Denmark	13	6,583	.86	15	6,295	.76	13	14,198	1.37	10	11,066	1.05	5	3,753	.32	10	4,999	.43
France	90	84,506	1.57	34	40,420	1.81	25	27,726	.79	32	33,291	.99	18	28,384	.66	18	16,430	.46
Germany	81	56,379	1.11	60	24,167	.26	23,095	.78	29	34,243	.84	9	6,489	.15	15	4,252	.11	
Holland	4	1,340	.10	23	11,550	.78	1	801	.03	4	2,689	.09	4	15,139	.51	8	549	.02
Italy	26	26,881	1.77	8	3,096	.28	16	38,810	1.37	26	38,226	1.16	10	17,246	.51	16	17,238	.55
Japan †	25	25,514	1.7	38	41,418	1.77	42	70,933	1.85	33	67,032	1.60	24	55,777	1.81	19	85,524	.83
Norway	61	60,648	2.47	41	44,132	2.37	22	23,786	.95	30	25,460	.79	10	10,680	.26	20	33,558	.82
Spain	13	15,928	1.89	16	9,752	1.30	10	10,181	.82	9	16,805	1.45	6	15,760	1.25	15	12,675	1.03
Sweden	30	17,327	1.65	88	29,021	2.92	16	16,627	1.33	11	8,236	.65	6	6,194	.36	14	11,901	.71
Other Countries	36	42,686	—	65	54,719	—	52	65,438	—	64	86,302	—	44	82,542	—	64	97,316	—
World's Total	542	608,235	—	635	622,805	—	422	531,545	—	403	556,126	—	249	378,164	—	311	355,855	—

\* Figures refer to steam, motor, and sailing vessels of 100 gross tons and over totally lost, condemned, etc. The tonnage given is gross for steamers and motorships, and net for sailing ships up to and including the returns for 1919; in subsequent returns the tonnage is gross for steamers, motorships, and sailing ships.

† Japanese sailing vessels not included.

‡ Excluding ships trading on the Great Lakes of America.

## LARGEST MERCHANT VESSELS OF THE WORLD. 327

## LARGEST MERCHANT VESSELS OF THE WORLD.

A list of all vessels of 10,000 tons gross or more arranged in order of gross tonnage.

(T.=turbine engines; M.=oil engines; T. &amp; R.=turbines &amp; reciprocating engines; T.E.=turbo-electric.)

Gross tonnage.	Name.	Speed (knots)	Date built.	Flag.	Owners.	L.* (ft.)	B.* (ft.)	D.* (ft.)
79,280	Normandie (T.E.) . . .	—	1933	Fr.	C.G.T. (French Line) . . .	1,029†	119'0	91'8
73,000	Queen Mary (T.) . . .	—	Br.	Cunard White Star . . .	1,018†	120'0	—	
56,599	Majestic (T.) . . .	25	1921	Br.	Cunard White Star . . .	915'5	100'1	58'2
52,101	Berengaria (T.) . . .	23	1912	Br.	Cunard White Star . . .	883'6	98'3	57'1
51,656	Bremen (T.) . . .	26	1929	Ger.	Norddeutscher Lloyd . . .	898'7	101'9	48'2
51,062	Rex (T.) . . .	26	1932	Ital.	Italia Line . . .	879'9†	97'0	30'7
49,746	Europa (T.) . . .	26	1928	Ger.	Norddeutscher Lloyd . . .	890'2	102'1	48'0
48,943	Leviathan (T.) . . .	24	1914	U.S.	United States Lines . . .	907'6	100'3	58'2
48,502	Conte di Savoia (T.) . . .	26	1932	Ital.	Italia Line . . .	814'6†	96'1	32'4
46,439	Olympic (T. & R.) . . .	22‡	1911	Br.	Cunard White Star . . .	852'5	92'5	59'5
45,647	Aquitania (T.) . . .	23	1914	Br.	Cunard White Star . . .	868'2	97'0	49'7
43,450	Ile de France (T.) . . .	23	1926	Fr.	C.G.T. (French Line) . . .	768'7	92'0	55'9
42,512	L'Atlantique (T.) . . .	24	1930	Fr.	Cie. de Nav. Sud-Atlantique . . .	713'6	91'8	57'7
42,348	Empress of Britain (T.) . . .	24	1931	Br.	Canadian Pacific . . .	733'8	97'8	56'0
34,569	Paris (T.) . . .	21‡	1921	Fr.	C.G.T. (French Line) . . .	735'4	85'8	59'1
34,351	Homerica . . .	20	1922	Br.	Cunard White Star . . .	751'0	88'3	48'6
32,583	Roma (T.) . . .	21	1926	Ital.	Italia Line . . .	705'6‡	82'6	38'9
32,565	Columbus (T.) . . .	21	1922	Ger.	Norddeutscher Lloyd . . .	749'6	83'1	49'4
30,696	Mauretania (T.) . . .	25	1907	Br.	Cunard White Star . . .	762'2	88'0	57'1
30,418	Augustus (M.) . . .	19	1927	Ital.	Italia Line . . .	710'9†	82'8	46'5
28,124	Champlain (T.) . . .	19	1931	Fr.	C.G.T. (French Line) . . .	607'0	82'8	67'8
28,291	Statendam (T.) . . .	19	1926	Holl.	Holland-Amerika Line . . .	674'2	81'3	49'4
27,759	Georgic (M.) . . .	18	1932	Br.	Cunard White Star . . .	683'6	82'4	48'6
27,561	Cap Arcona (T.) . . .	20	1927	Ger.	Hamburg Sud-Amerika Line . . .	643'6	84'6	41'9
27,132	Beigenland (T. & R.) . . .	17‡	1917	Br.	F. Leyland & Co. . .	674'2	78'4	44'7
26,943	Britannic (M.) . . .	18	1930	Br.	Cunard White Star . . .	683'6	82'4	48'6
26,032	Empress of Japan (T.) . . .	—	1930	Br.	Canadian Pacific . . .	644'0	83'8	44'5
25,061	Conte Grande (T.) . . .	21	1928	Ital.	Italia Line . . .	662'2‡	78'3	27'2
25,178	Lafayette (M.) . . .	17	1929	Fr.	C.G.T. (French Line) . . .	577'2	77'6	27'9
24,416	Conte Biancamano (T.) . . .	20	1925	Ital.	Italia Line . . .	650'9‡	76'1	27'5
24,289	Manhattan (T.) . . .	20	1932	U.S.	United States Lines . . .	668'4	86'3	33'8
24,289	Washington (T.) . . .	20	1983	U.S.	United States Lines . . .	668'4	86'3	33'3
24,149	Rotterdam . . .	17	1908	Holl.	Holland-Amerika Line . . .	650'5	77'4	43'5
24,000	Orion (T.) . . .	—	1935	Br.	Orient Line . . .	665'0	82'0	—
23,970	Vulcania (M.) . . .	19	1927	Ital.	Coucillich Line . . .	631'4‡	79'8	24'4
23,940	Saturnia (M.) . . .	19	1927	Ital.	Coucillich Line . . .	631'4‡	79'8	20'6
23,788	George Washington . . .	18	1908	U.S.	U.S. Shipping Board . . .	699'1	78'2	50'1
23,635	Duilio (T.) . . .	21	1923	Ital.	Italia Line . . .	635'6‡	76'3	46'3
23,337	New York (T.) . . .	10‡	1927	Ger.	Hamburg-Amerika Line . . .	645'6	72'4	42'1
22,575	Queen of Bermuda (T.E.) . . .	20	1933	Br.	Furness Withy . . .	558'4	76'7	39'0
22,424	Monarch of Bermuda (T.E.) . . .	20	1931	Br.	Furness Withy . . .	533'2	76'7	39'0
22,284	Strathaird (T.E.) . . .	21	1932	Br.	F. & O. . .	638'0	80'0	33'0
22,283	Strathnaver (T.E.) . . .	21	1931	Br.	F. & O. . .	638'7	80'2	33'1
22,181	Alcantara (M.)	16‡	1926	Br.	Royal Mail . . .	630'5	78'5	40'5
22,117	Hamburg (T.) . . .	19‡	1927	Ger.	Hamburg-Amerika Line . . .	645'6	72'4	42'1
22,048	Asturias (T.) . . .	—	1925	Br.	Royal Mail . . .	640'5	78'5	40'5
21,936	President Hoover (T.E.) . . .	21	1930	U.S.	Dollar S.S. Lines . . .	615'0	81'0	52'0
21,936	President Coolidge (T.E.) . . .	21	1931	U.S.	Dollar S.S. Lines . . .	615'0	81'0	52'0
21,900	Giulio Cesare (T.) . . .	19	1921	Ital.	Italian Line . . .	634'0†	76'1	46'3
21,833	Empress of Australia (T.) . . .	18	1914	Br.	Canadian Pacific . . .	589'9	75'2	41'6
21,517	Empress of Canada (T.) . . .	20	1922	Br.	Canadian Pacific . . .	627'0	77'9	42'2
21,329	America . . .	17	1905	U.S.	U.S. Shipping Board . . .	668'8	74'3	47'8
21,046	Deutschland (T.) . . .	19‡	1923	Ger.	Hamburg-Amerika Line . . .	645'8	72'2	41'9
21,011	Cap Polonio (T. & R.) . . .	18	1914	Ger.	Hamburg Sud-Amerika Line . . .	637'8	72'4	39'5
20,852	Mooltan (B. & T.E.) . . .	17‡	1923	Br.	F. & O. . .	600'8	73'4	48'6
20,914	Malolo (T. & R.) . . .	17‡	1923	Br.	F. & O. . .	600'8	73'4	48'6
20,445	Warwick Castle (M.) . . .	17	1930	Br.	Union Castle Line . . .	651'5	75'5	37'4
20,277	Carinthia (T.) . . .	16‡	1925	Br.	Cunard White Star . . .	600'7	73'8	40'7
20,223	Kungaholm (M.) . . .	18	1928	Swed.	Svenska-Amerika Line . . .	594'9	78'2	37'8
20,175	Franconia (T.) . . .	16‡	1923	Br.	Cunard White Star . . .	601'3	73'7	40'6
20,131	Albert Ballin (T.) . . .	19‡	1923	Ger.	Hamburg-Amerika Line . . .	645'8	72'2	41'9
20,123	Duchess of Bedford (T.) . . .	17‡	1928	Br.	Canadian Pacific . . .	581'9	75'2	41'8
20,119	Duchess of Atholl (T.) . . .	17‡	1928	Br.	Canadian Pacific . . .	580'0	75'3	41'8
20,109	Winchester Castle (M.) . . .	17	1930	Br.	Union Castle Line . . .	631'6	75'5	37'6
20,068	Carnarvon Castle (M.) . . .	16‡	1926	Br.	Union Castle Line . . .	630'7	73'5	41'5

\* The registered dimensions are measured as follows: Length from fore part of stem at extreme top to aft side of head of stern post, or centre of rudder stock if a balanced rudder is fitted; Breadth is taken to outside of plating; Depth from top of beam at centre line of tonnage deck amidships to ceiling. If there is no ceiling it is measured to the tank top. If there are more than two decks, the tonnage deck is the second deck, counting from below.

† The speeds shown in this Table are as given by the owners.

‡ Overall lengths; particulars of Normandie and Queen Mary are provisional.

§ Gutted by fire on January 5, 1933

|| Under conversion to turbine drive.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed (knots).	Date built.	Flag.	Owners.	L. * (ft.)	B. * (ft.)	D. * (ft.)
20,033	Otranto (T.)	18	1925	Br.	Orient Line . . . . .	632-0	75-2	32-9
20,022	Duchess of Richmond (T.)	18	1928	Br.	Canadian Pacific . . . . .	581-9	75-2	41-7
20,021	Duchess of York (T.)	18	1929	Br.	Canadian Pacific . . . . .	581-9	75-2	41-7
20,001	Oronsay (T.)	18	1925	Br.	Orient Line . . . . .	633-6	75-2	33-0
19,970	Orontes (T.)	18	1929	Br.	Orient Line . . . . .	632-0	75-2	33-0
19,941	Orford (T.)	18	1927	Br.	Orient Line . . . . .	632-2	75-4	33-1
19,821	Reliance (T. & R.)	17	1920	Ger.	Hamburg-Amerika Line . . . . .	590-4	72-3	39-7
19,819	Orama (T.)	18	1924	Br.	Orient Line . . . . .	632-0	75-2	32-9
19,761	Scythia (T.)	16½	1920	Br.	Cunard White Star . . . . .	600-7	73-8	40-7
19,703	Resolute (T. & R.)	17	1920	Ger.	Hamburg-Amerika Line . . . . .	590-4	72-2	40-2
19,695	Laconia (T.)	16½	1922	Br.	Cunard White Star . . . . .	601-3	73-7	40-6
19,627	Viceroy of India (T.E.)	18	1928	Br.	P. & O. . . . .	582-7	76-0	45-5
19,597	Samaria (T.)	16½	1921	Br.	Cunard White Star . . . . .	601-5	73-7	40-7
19,507	Oceania (M.)	19	1933	Ital.	Coullich Line . . . . .	589-7½	76-7	45-5
19,475	Neptunia (M.)	19	1932	Ital.	Coullich Line . . . . .	589-7½	76-5	45-5
19,361	Monticello .	23½	1902	U.S.	U.S. Shipping Board . . . . .	684-3	72-3	40-2
19,129	Marnix v. St. Aldegonde (M.)	17	1929	Holl.	Nederland Stoom. Maats. . . . .	580-0	74-0	47-3
19,040	Johan v. Oldenbarneveldt (M.)	17	1929	Holl.	Nederland Stoom. Maats. . . . .	580-0	74-6	47-3
19,029	Arundel Castle (T.)	16½	1921	Br.	Union Castle Line . . . . .	630-5	72-5	41-5
18,973	Windsor Castle (T.)	16½	1922	Br.	Union Castle Line . . . . .	632-4	72-5	41-6
18,765	Conte Verde (T.)	19½	1923	Ital.	Lloyd Triestino . . . . .	570-2	74-2	35-9
18,724	Laurentic (T. & R.)	17	1927	Br.	Cunard White Star . . . . .	578-2	75-4	40-6
18,495	Ceramic (T. & R.)	16	1913	Br.	Shaw, Savill & Albion . . . . .	655-1	69-4	43-8
18,435	De Grasse (T.)	16	1924	Fr.	C.G.T. (French Line) . . . . .	552-1	71-4	42-3
18,372	Mount Vernon	23½	1906	U.S.	U.S. Shipping Board . . . . .	685-4	72-2	40-5
18,298	Virginia (T.E.)	18	1928	U.S.	American Line S.S. Corp. . . . .	586-4	80-3	52-0
18,200	Pennsylvania (T.E.)	—	1929	U.S.	American Line S.S. Corp. . . . .	586-0	80-3	20-5
18,021	Lurline (T.)	22	1932	U.S.	Matson Nav. Co. . . . .	604-0	79-3	30-5
18,017	Mariposa (T.)	22	1931	U.S.	Oceanic S.S. Co. . . . .	604-0	79-3	30-5
18,017	Monterey (T.)	22	1932	U.S.	Oceanic S.S. Co. . . . .	604-0	79-3	30-5
17,944	Gripsholm (M.)	17	1925	Swed.	Svenska-Amerika Line . . . . .	553-0	74-4	37-7
17,856	Conte Rosso (T.)	19	1922	Ital.	Lloyd Triestino . . . . .	588-2½	74-2	35-9
17,833	California (T.E.)	18	1928	U.S.	American Line S.S. Corp. . . . .	574-4	80-3	52-0
17,801	Kosmos	—	1929	Nor.	A. Jahre . . . . .	554-1	77-2	49-6
17,707	Reina del Pacifico (M.)	19	1930	Br.	Pacific Stm. Nav. Co. . . . .	551-0	76-3	38-5
17,537	Aramis (M.)	15½	1932	Fr.	Messageries Maritimes . . . . .	543-5	69-6	33-6
17,498	Chichibu Maru (M.)	19	1930	Jap.	Nippon Yusen Kaisha . . . . .	560-0	74-0	42-5
17,491	Aorangi (M.)	17	1924	Br.	Canadian-Australasian Line . . . . .	580-1	72-2	43-4
17,281	Minnekahda (T. & R.)	16	1917	U.S.	Atlantic Transport Line . . . . .	620-5	66-4	47-3
17,232	Malolo (T.)	22	1927	U.S.	Matson Nav. Co. . . . .	554-0	83-3	30-7
17,046	Caledonia (T.)	15½	1925	Br.	Anchor Line . . . . .	553-0	70-4	38-7
16,991	Tuscania (T.)	15½	1922	Br.	Anchor Line . . . . .	562-3	70-3	38-6
16,981	Balceran (M.)	18	1929	Holl.	Rotterdam Lloyd . . . . .	550-0	70-0	44-0
16,979	Dempo (M.)	18	1930	Holl.	Rotterdam Lloyd . . . . .	550-0	70-0	44-0
16,975	Asama Maru (M.)	19	1928	Jap.	Nippon Yusen Kaisha . . . . .	560-0	72-0	42-6
16,975	Tatsuta Maru (M.)	19	1929	Jap.	Nippon Yusen Kaisha . . . . .	560-0	72-0	42-5
16,966	Kosmos II.	—	1931	Nor.	A. Jahre . . . . .	553-4	77-2	37-6
16,923	Transylvania (T.)	15½	1925	Br.	Anchor Line . . . . .	552-4	70-3	30-3
16,909	Empress of Asia (T.)	20	1913	Br.	Canadian Pacific . . . . .	570-1	68-2	42-0
16,810	Empress of Russia (T.)	20	1913	Br.	Canadian Pacific . . . . .	570-2	68-2	42-0
16,792	California (T.)	15½	1923	Br.	Anchor Line . . . . .	553-0	70-4	38-8
16,774	Felix Roussel (M.)	15	1929	Fr.	Messageries Maritimes . . . . .	534-8	68-2	46-9
16,738	Ranchi (T. & R.)	18	1925	Br.	P. & O. . . . .	548-5	71-3	43-2
16,737	Rangitane (M.)	15	1929	Br.	Federal Steam Nav. Co. . . . .	531-0	70-2	31-8
16,732	St. Louis (M.)	16	1928	Ger.	Hamburg-Amerika Line . . . . .	543-8	72-4	42-1
16,712	Rangitane (M.)	15	1929	Br.	New Zealand Shipping Co. . . . .	531-0	70-2	31-8
16,699	Milwaukee (M.)	16	1920	Ger.	Hamburg-Amerika Line . . . . .	546-6	72-4	42-2
16,698	Rangitiki (M.)	15	1929	Br.	New Zealand Shipping Co. . . . .	531-0	70-2	38-1
16,697	Kawaipindi	17	1925	Br.	P. & O. . . . .	547-7	71-3	43-4
16,688	Ranpura	17	1925	Br.	P. & O. . . . .	548-3	71-3	43-2
16,644	Rajputana	17	1926	Br.	P. & O. . . . .	547-7	71-3	43-4
16,632	Narkunda	17½	1920	Br.	P. & O. . . . .	581-4	69-4	27-7
16,600	Mongolia (T.)	16	1923	Br.	P. & O. . . . .	551-6	72-0	38-5
16,556	Moldavia (T.)	16	1922	Br.	P. & O. . . . .	552-4	71-7	38-4
16,500	Westerland (T. & R.)	16	1918	Br.	F. Leyland & Co. . . . .	575-3	67-8	41-9
16,484	Doric (T.)	16	1923	Br.	Cunard White Star . . . . .	575-5	67-9	41-7
16,436	C. O. Stillman (M.)	—	1928	Br.	International Petroleum Co. . . . .	565-7	75-6	44-5
16,418	Montcalm (T.)	17	1921	Br.	Canadian Pacific . . . . .	549-5	70-2	40-2
16,402	Montrose (T.)	17	1922	Br.	Canadian Pacific . . . . .	548-7	70-2	40-3
16,322	Pennland (T. & R.)	16	1922	Br.	F. Leyland & Co. . . . .	575-4	67-8	41-2
16,314	Montclare (T.)	17	1922	Br.	Canadian Pacific . . . . .	549-5	70-2	40-2
16,297	Cameronia (T.)	15½	1920	Br.	Anchor Line . . . . .	552-4	70-4	38-8
16,243	Lancastria (T.)	16½	1922	Br.	Cunard White Star . . . . .	552-8	70-4	38-8
16,113	Naldera	17½	1918	Br.	P. & O. . . . .	580-9	67-2	44-4
16,063	Calgarie (T. & R.)	15	1918	Br.	Cunard White Star . . . . .	550-3	67-3	43-0
15,704	Christiaan Huygens (M.)	17	1927	Holl.	Nederland Stoom. Maats. . . . .	551-5	68-8	36-2
15,575	President Fillmore	16	1904	U.S.	Dollar S.S. Lines . . . . .	600-0	65-3	31-1

\* † ‡ See notes on p. 327.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage	Name.	Speed † (knots.)	Date built.	Flag.	Owners.	L.♦ (ft.)	B.♦ (ft.)	D.♦ (ft.)
15,551	Almanzora (T. & R.)	16	1914	Br.	Royal Mail . . . . .	570-0	67-3	33-3
15,543	President Johnson	16	1904	U.S.	Dollar S.S. Lines . . . . .	600-0	65-3	31-1
15,507	Orduña (T. & R.)	15	1914	Br.	Pacific Stm. Nav. Co. . . . .	550-3	67-3	43-0
15,495	Orbita (T. & R.)	15	1915	Br.	Pacific Stm. Nav. Co. . . . .	550-3	67-3	43-0
15,450	Veendam (T.)	16	1923	Holl.	Holland-Amerika Line . . . . .	550-2	67-3	41-1
15,484	Volendam (T.)	15	1922	Holl.	Holland-Amerika Line . . . . .	550-2	67-3	32-6
15,363	Massilia (T. & R.)	20	1920	Fr.	Cie. de Nav. Sud Atlantique . . . . .	577-1	64-1	37-0
15,357	Svealand (M.)	—	1925	Swed.	Angl. Akt. Tirsing . . . . .	561-3	72-2	44-1
15,355	Amerikaland (M.)	—	1925	Swed.	Angl. Akt. Tirsing . . . . .	561-3	72-2	44-1
15,348	Chitral (T. & R.)	17	1925	Br.	P. & O. . . . .	526-3	70-3	42-3
15,286	Berlin	16	1925	Ger.	Norddeutscher Lloyd . . . . .	549-3	69-2	34-8
15,276	Athos II (T.)	14	1925	Fr.	Messageries Maritimes . . . . .	543-9	66-2	41-7
15,241	Comorin (T. & R.)	17	1925	Br.	P. & O. . . . .	523-5	70-2	42-3
15,223	Cathay	16 <sup>1</sup>	1925	Br.	P. & O. . . . .	523-5	70-2	42-3
15,186	Minnedosa (T. & R.)	16 <sup>1</sup>	1918	Br.	Canadian Pacific . . . . .	520-0	67-2	41-8
15,183	Melita (T. & R.)	16 <sup>1</sup>	1918	Br.	Canadian Pacific . . . . .	520-0	67-2	50-3
15,178	Arandora Star (T.)	16	1927	Br.	Blue Star Line . . . . .	512-8	68-3	42-5
15,135	Atlantis (T. & R.)	16	1913	Br.	Royal Mail . . . . .	570-3	67-3	33-3
15,128	Akaros (T. & R.)	15	1914	Br.	Shaw, Savill & Albion . . . . .	550-7	67-4	44-1
15,105	D'Artagnan	14	1924	Br.	Messageries Maritimes . . . . .	543-5	65-0	41-4
14,982	Ormonde (T.)	17	1917	Fr.	Orient Line . . . . .	580-5	66-7	40-5
14,825	Chenonceaux	13	1922	Fr.	Messageries Maritimes . . . . .	543-4	65-1	41-1
14,783	Lutetia (T. & R.)	20	1913	Fr.	Cie. de Nav. Sud Atlantique . . . . .	579-0	64-1	36-7
14,690	General von Steuben (T. & R.)	16	1922	Ger.	Norddeutscher Lloyd . . . . .	526-9	65-0	43-7
14,652	Ulysses	14	1913	Br.	Blue Funnel Line . . . . .	563-2	68-4	40-2
14,629	Nestor	14	1913	Br.	Blue Funnel Line . . . . .	563-2	68-4	31-2
14,622	Arlanza (T. & R.)	16	1912	Br.	Royal Mail . . . . .	570-3	65-3	33-3
14,508	Svend Foyn	—	1931	Br.	St. Helier Shipowners . . . . .	5381	74-3	33-3
14,547	Vestfold	—	1931	Br.	Vestfold Whaling Co. . . . .	5381	74-3	33-3
14,526	Vikingen	—	1929	Panama	Viking Corp. of Panama . . . . .	493-0	71-1	50-0
14,457	Talyo Maru	—	1911	Jap.	Nippon Yusen Kaisha . . . . .	560-0	65-3	31-2
14,362	Sir James Clark Ross (M.)	16	1930	Nor.	Hvalfangar A/S Rossavet . . . . .	537-9	74-3	34-4
14,303	Charles G. Black	—	1921	U.S.	Standard Oil Co. . . . .	550-3	72-2	43-7
14,204	Hobson's Bay (T.)	16	1922	Br.	Aberdeen-Commonwealth . . . . .	530-6	68-3	39-9
14,193	Moreton Bay (T.)	16	1921	Br.	Aberdeen-Commonwealth . . . . .	530-6	68-3	39-9
14,187	President Madison (T.)	18	1921	U.S.	American Mail Line . . . . .	516-5	72-2	27-8
14,182	Lars Bay (T.)	16	1921	Br.	Aberdeen-Commonwealth . . . . .	530-9	68-3	39-9
14,182	Carthage (T.)	18	1931	Br.	P. & O. . . . .	522-5	71-4	33-1
14,176	Esperance Bay (T.)	16	1922	Br.	Aberdeen-Commonwealth . . . . .	530-9	68-3	39-9
14,174	President Jefferson (T.)	18	1920	U.S.	American Mail Line . . . . .	516-5	72-2	27-8
14,170	Corfa (T.)	18	1931	Br.	P. & O. . . . .	522-5	71-4	33-1
14,164	Jervis Bay (T.)	16	1922	Br.	Aberdeen-Commonwealth . . . . .	530-6	68-3	39-9
14,157	Highland Patriot (M.)	16	1932	Br.	Royal Mail (Nelson) . . . . .	523-4	69-4	37-1
14,137	Highland Monarch (M.)	16	1928	Br.	Royal Mail (Nelson) . . . . .	523-4	69-4	37-1
14,131	Highland Chieftain (M.)	16	1929	Br.	Royal Mail (Nelson) . . . . .	523-4	69-4	37-1
14,131	Highland Brigade (M.)	16	1929	Br.	Royal Mail (Nelson) . . . . .	523-4	69-4	37-1
14,128	Highland Princess (M.)	16	1928	Br.	Royal Mail (Nelson) . . . . .	523-4	69-4	37-1
14,127	President McKinley (T.)	18	1921	U.S.	American Mail Line . . . . .	516-5	72-2	27-8
14,124	President Jackson (T.)	18	1921	U.S.	American Mail Line . . . . .	517-0	72-2	27-8
14,119	President Grant (T.)	18	1921	U.S.	American Mail Line . . . . .	517-0	72-2	27-8
14,075	Oropesa (T.)	15	1920	Br.	Pacific Stm. Nav. Co. . . . .	530-0	66-3	41-2
14,054	William Rockefeller	—	1921	U.S.	Standard Oil Co. . . . .	554-9	75-3	43-0
14,030	Alaunia (T.)	15	1925	Br.	Cunard White Star . . . . .	519-6	65-2	39-2
14,013	Ascania (T.)	15	1925	Br.	Cunard White Star . . . . .	520-0	65-3	39-0
13,984	Aurania (T.)	15	1924	Br.	Cunard White Star . . . . .	519-7	65-3	39-2
13,950	Andania (T.)	15	1922	Br.	Cunard White Star . . . . .	520-2	65-3	39-2
13,912	Ausonia (T.)	15	1921	Br.	Cunard White Star . . . . .	520-0	65-3	39-1
13,882	Monte Rosa (M.)	14 <sup>1</sup>	1930	Ger.	Hamburg Sud-Amerika Line . . . . .	500-3	65-7	37-8
13,870	Monte Pascoal (M.)	14 <sup>1</sup>	1930	Ger.	Hamburg Sud-Amerika Line . . . . .	500-3	65-7	37-8
13,869	President Harding (T.)	18	1921	U.S.	United States Lines . . . . .	516-5	72-2	27-8
13,868	President Roosevelt (T.)	19	1922	U.S.	United States Lines . . . . .	516-5	72-2	27-8
13,868	Gelria	16 <sup>1</sup>	1913	Holl.	Holland Lloyd . . . . .	541-1	65-8	35-3
13,867	Antonia (T.)	15	1921	Br.	Cunard White Star . . . . .	519-9	65-3	39-1
13,801	New Sevilla	12	1900	Br.	Sevilla Whaling Co. . . . .	550-2	63-3	47-0
13,797	Hektoria	13	1899	Br.	Hektoria, Ltd. . . . .	550-2	63-3	32-0
13,788	Southern Cross (T.)	18 <sup>1</sup>	1920	U.S.	Munson S.S. Line . . . . .	516-5	72-2	27-8
13,750	Monte Olivia (M.)	14 <sup>1</sup>	1924	Ger.	Hamburg Sud-Amerika Line . . . . .	500-6	65-8	37-9
13,738	American Legion (T.)	18 <sup>1</sup>	1920	U.S.	Munson S.S. Line . . . . .	516-5	72-2	27-8
13,712	Pan America (T.)	18 <sup>1</sup>	1921	U.S.	Munson S.S. Line . . . . .	517-0	72-2	27-8
13,712	Western World (T.)	18 <sup>1</sup>	1921	U.S.	Munson S.S. Line . . . . .	517-0	72-2	41-0
13,682	André Lebon	14	1913	Fr.	Messageries Maritimes . . . . .	508-2	61-6	45-8
13,640	Tafelberg	—	1930	Br.	Kerguelen Seal'g & Whal'g Co. . . . .	508-3	72-5	35-7
13,623	Monte Sarmiento (M.)	14 <sup>1</sup>	1924	Ger.	Hamburg Sud-Amerika Line . . . . .	500-6	65-8	37-9
13,615	Sierra Salvada (T. & R.)	14 <sup>1</sup>	1922	Ger.	Hamburg Sud-Amerika Line . . . . .	499-5	64-0	38-7
13,589	Antonio Delfino (T. & R.)	14 <sup>1</sup>	1921	Ger.	Hamburg Sud-Amerika Line . . . . .	499-5	64-0	38-7
13,475	Letitia (T.)	15 <sup>1</sup>	1925	Br.	Anchor-Donaldson . . . . .	525-7	66-4	29-5
13,463	Athenia (T.)	15 <sup>1</sup>	1923	Br.	Anchor-Donaldson . . . . .	526-3	66-4	38-1

\* See notes on p. 327.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed (Knots).	Date built.	Flag.	Owners.	L.° (ft.)	B.° (ft.)	D.° (ft.)
13,415	Niagara (T. & R.)	16	1913	Br.	Canadian Australasian Line	524·7	66·3	34·5
13,391	Colombie (T.)	16	1931	Fr.	C.G.T. (French Line)	428·8	66·4	46·2
13,387	Stuttgart	16	1923	Ger.	Norddeutscher Lloyd	527·0	65·0	34·7
13,376	Avelona Star (T.)	16	1927	Br.	Blue Star Line	510·2	68·2	42·6
13,363	Balmoral Castle	16	1910	Br.	Union Castle Line	570·0	64·5	38·9
13,329	Edinburgh Castle	16	1910	Br.	Union Castle Line	570·2	64·7	38·7
13,248	Voltaire	14½	1923	Br.	Lampert & Holt	510·6	64·3	39·3
13,247	Juvenal	—	1928	Arg.	Cia. Gen. de Combustibles	556·0	74·1	40·3
13,246	C. A. Larsen	—	1913	Nor.	Hvalfangar A/S, Rosshavet	527·2	66·6	33·9
13,241	Vandyck (T.)	14½	1921	Br.	Lampert & Holt	510·6	64·3	39·3
13,156	Stavangerfjord (T. & R.)	17½	1918	Nor.	Norsk-Amerika Line	532·5	64·2	29·3
13,072	Baradine (T. & R.)	15½	1921	Br.	P. & O.	519·9	64·4	37·6
13,068	Victoria (M.)	—	1931	Ital.	Lloyd Triestino	540·6	69·9	30·9
13,062	Barrabool (T. & R.)	15½	1922	Br.	P. & O.	519·9	64·4	37·5
13,056	San Fernando (T.)	14	1919	Br.	Eagle Oil Transport Co.	530·4	69·4	42·2
13,087	San Felix (T.)	—	1921	Br.	Eagle Oil Transport Co.	530·4	69·4	42·2
13,081	San Fabian (T.)	11	1922	Br.	Eagle Oil Transport Co.	530·5	69·4	42·0
13,026	Shinnyo Maru (T.)	16	1911	Jap.	Nippon Yusen Kaisha	558·0	61·9	35·5
12,999	Armadale Castle	15½	1908	Br.	Union Castle Line	570·1	64·5	39·0
12,996	Ballarat (T. & R.)	16	1921	Br.	P. & O.	519·8	64·2	37·8
12,995	Ausonia (T.)	21	1928	Ital.	Lloyd Triestino	544·1	66·4	31·2
12,990	Bairnsdale (T. & R.)	15½	1922	Br.	P. & O.	519·8	64·2	29·8
12,975	Kilnworth Castle	15½	1904	Br.	Union Castle Line	570·2	64·7	38·7
12,972	Bendigo (T. & R.)	15½	1922	Br.	P. & O.	519·8	64·2	37·8
12,951	California (T.)	14	1920	Ital.	Nav. Libera Triestina	523·1	64·0	43·9
12,915	San Gerardo (T.)	—	1922	Br.	Eagle Oil Transport Co.	530·2	68·5	42·1
12,910	San Gaspar (T.)	—	1921	Br.	Eagle Oil Transport Co.	530·2	68·5	42·1
12,872	Avila Star (T.)	16	1927	Br.	Blue Star Line	510·2	68·2	33·9
12,848	Almeda Star (T.)	16	1926	Br.	Blue Star Line	512·2	68·3	34·0
12,846	Andalucia Star (T.)	16	1927	Br.	Blue Star Line	512·2	68·3	34·0
12,842	San Florentino (T.)	—	1919	Br.	Eagle Oil Transport Co.	530·4	68·6	42·0
12,700	President Doumer (M.)	—	1933	Fr.	Messageries Maritimes	467·0	64·0	40·4
12,692	Porthos	13½	1914	U.S.	Messageries Maritimes	510·8	61·6	42·1
12,642	City of Los Angeles (T.)	16	1899	U.S.	Los Angeles S.S. Co.	560·6	62·3	36·9
12,590	John D. Archbold	—	1921	U.S.	Standard Oil Co.	570·2	75·1	42·6
12,589	Cabo Santo Tome (M.)	—	1931	Sp.	Ybarra & Co.	482·5	63·4	33·4
12,580	President Lincoln (T.)	18	1921	U.S.	Dollar S.S. Lines	516·5	72·2	27·8
12,575	President Wilson (T.)	18	1921	U.S.	Dollar S.S. Lines	516·5	72·2	27·8
12,554	President Cleveland (T.)	18	1921	U.S.	Dollar S.S. Lines	517·0	72·2	36·8
12,548	President Taft (T.)	18	1921	U.S.	Dollar S.S. Lines	517·0	72·2	27·8
12,546	President Pierce (T.)	18	1921	U.S.	Dollar S.S. Lines	517·0	72·2	27·8
12,510	Gulfpride (M.)	—	1927	U.S.	Gulf Refining Co.	525·0	74·3	31·6
12,442	Geo. W. McKnight (M.)	12	1933	Danzig	Baltisch-Amer. Petrol. Import	521·7	70·4	38·7
12,432	F. J. Wolfe (M.)	12	1932	Danzig	Baltisch-Amer. Petrol. Import	521·4	70·3	38·6
12,425	Franz Klasen (M.)	12	1932	Danzig	Baltisch-Amer. Petrol. Import	521·4	70·4	38·7
12,424	Victor Rose (M.)	12	1933	Danzig	Baltisch-Amer. Petrol. Import	521·4	70·3	38·6
12,421	Orville Harden (M.)	12	1933	Danzig	Deutsch-Amer. Petrol. Import	522·0	70·4	38·7
12,405	Tamaroa (T.)	15	1922	Br.	Shaw, Savill & Albion	500·4	63·2	39·6
12,390	Mataroa (T.)	15	1922	Br.	Shaw, Savill & Albion	500·4	63·2	39·6
12,385	Saxon	15½	1900	Br.	Union Castle Line	570·5	64·4	38·6
12,358	Skytteren	—	1901	Nor.	A/S. Skytteren	550·2	63·3	39·9
12,353	Southern Empress	11	1914	Br.	Southn. Whaling & Sealing Co.	525·2	66·5	33·9
12,352	Ionic	13	1902	Br.	Shaw, Savill & Albion	500·3	63·3	45·0
12,334	D. L. Harper (M.)	12	1932	Danzig	Baltisch-Amer. Petrol. Import	519·8	70·0	38·7
12,306	Marguerite Finaly (M.)	—	1933	Fr.	Soc. Aux. des Transports	522·0	70·2	38·6
12,306	Sultan Star (T.)	16	1930	Br.	Blue Star Line	486·1	70·2	38·6
12,286	San Melito	—	1914	Br.	Eagle Oil Transport Co.	530·0	66·5	38·5
12,275	Cabo San Antonio (M.)	—	1930	Sp.	Ybarra & Co.	482·5	63·4	33·4
12,272	Gango	18	1912	Ital.	Lloyd Triestino	477·5	60·2	43·2
12,263	Champion	—	1924	Fr.	Messageries Maritimes	495·1	62·7	40·5
12,257	Oroya (T.)	14	1923	Br.	Pacific Steam Nav. Co.	525·3	62·8	32·1
12,246	Soligmst	15½	1900	Nor.	A/S. Odd	547·1	62·1	34·6
12,239	Mariette Pacha	15	1925	Fr.	Messageries Maritimes	508·5	62·6	43·6
12,223	J. A. Mowinckel (M.)	12	1930	Danzig	Baltisch-Amer. Petrol. Import	521·8	70·4	38·6
12,220	Mexique (T. & R.)	17	1915	Fr.	C.G.T. (French Line)	546·7	64·0	34·8
12,215	Thorshammer	11	1914	Nor.	A/S. Bryde & Dahls	525·5	66·5	41·4
12,201	Ole Wegget	11	1914	Nor.	A/S. Ornen	527·1	66·6	42·1
12,197	Robert F. Hand (M.)	—	1933	Br.	Anglo-American Oil Co.	520·0	69·8	38·7
12,173	R. L. Hague (M.)	12	1932	Ital.	"La Columbia" Soc. Marit.	542·3	70·2	38·7
12,107	J. H. Senior (M.)	12	1931	Danzig	Baltisch-Amer. Petrol. Import	521·2	70·3	38·9
12,097	Helnrich v. Riedemann (M.)	12	1930	Danzig	Baltisch-Amer. Petrol. Import	521·1	70·2	38·8
12,092	Southern Princess	—	1915	Br.	Southn. Whaling & Sealing Co.	530·0	66·6	33·5
12,076	Cadillac	10½	1917	Br.	Anglo-American Oil Co.	530·2	66·3	33·8
12,074	Saranac	10½	1918	Br.	Anglo-American Oil Co.	530·5	66·3	42·7
12,067	Pelagos	13	1901	Nor.	Hvalfangselsk. Pelagos A/S	500·3	63·3	45·0
12,055	Cordillera (M.)	16½	1933	Ger.	Hamburg-Amerika Line	497·8	65·9	27·3
12,049	Caribia (M.)	16½	1932	Ger.	Hamburg-Amerika Line	497·8	65·8	27·9

\* † : See notes on p. 327.

## LARGEST MERCHANT VESSELS OF THE WORLD. 331

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed † (knots).	Date built.	Flag.	Owners.	L. * (ft.)	B. * (ft.)	D. * (ft.)
12,041	Orsova . . . . .	16	1909	Br.	Orient Line . . . . .	536-2	63-3	34-3
12,040	Sibajak (M.) . . . . .	17	1927	Holl.	Rotterdam Lloyd . . . . .	506-6	62-7	35-2
12,003	Colombo . . . . .	16	1917	Ital.	Italia Line . . . . .	518-0	64-0	24-2
11,999	Athelcrown (M.) . . . . .	—	1929	Br.	United Molasses Co. . . . .	526-5	68-8	38-9
11,996	Providence . . . . .	15	1915	Fr.	Cie. Fr. de N. (Cyp. Fabre) . . . . .	511-8	59-7	43-5
11,952	Peter Hurl (M.) . . . . .	12	1930	Danzig	Baltisch-Amer. Petrol. Import . . . . .	521-2	70-2	38-7
11,951	Llangibby Castle (M.) . . . . .	15†	1929	Br.	Union Castle Line . . . . .	486-0	66-2	27-8
11,941	Calgorolite (M.) . . . . .	—	1928	Br.	Imperial Oil . . . . .	522-0	70-3	38-7
11,938	Saivestria . . . . .	12	1913	Br.	South Georgia Co. . . . .	500-3	62-4	34-6
11,930	Terukuni Maru (M.) . . . . .	16†	1930	Jap.	Nippon Yusen Kaisha . . . . .	507-0	64-0	37-0
11,930	Yasukuni Maru (M.) . . . . .	16†	1930	Jap.	Nippon Yusen Kaisha . . . . .	505-0	64-0	37-0
11,901	Stuart Star (T.) . . . . .	15	1926	Br.	Blue Star Line . . . . .	475-8	67-3	36-6
11,885	Patria . . . . .	15	1913	Fr.	Cie. Fr. de N. (Cyp. Fabre) . . . . .	487-2	59-2	40-1
11,868	Cabo San Agustin (M.) . . . . .	—	1931	Sp.	Ybarri & Co. . . . .	482-5	63-4	33-4
11,867	Afric Star (T.) . . . . .	15	1926	Br.	Blue Star Line . . . . .	475-8	67-3	36-6
11,862	F. H. Bedford, Jr. (M.) . . . . .	12	1930	Danzig	Baltisch-Amer. Petrol. Import . . . . .	521-4	70-2	38-7
11,850	Frederik VIII. . . . .	17	1913	Dan.	Forenede Damps. S. . . . .	523-5	62-3	38-3
11,847	Korea Maru . . . . .	16	1901	Jap.	Nippon Yusen Kaisha . . . . .	551-7	63-2	40-8
11,814	Siberia Maru . . . . .	16	1901	Jap.	Nippon Yusen Kaisha . . . . .	551-7	63-2	21-8
11,803	Rodney Star (T.) . . . . .	15	1927	Br.	Blue Star Line . . . . .	476-9	67-3	36-6
11,787	W. S. Farish (T.) . . . . .	—	1930	U.S.	Standard Shipping Co. . . . .	525-0	74-3	40-5
11,752	G. Harrison Smith (T.) . . . . .	—	1930	U.S.	Standard Shipping Co. . . . .	525-0	74-3	40-5
11,732	Marechal Joffre (M.) . . . . .	14	1933	Fr.	Messageries Maritimes . . . . .	468-7	64-0	37-9
11,718	Virgilio (M.) . . . . .	15	1927	Ital.	Italia Line . . . . .	506-1	61-8	32-4
11,689	Orazio (M.) . . . . .	15	1927	Ital.	Italia Line . . . . .	506-1	61-8	40-6
11,636	Slamat (T.) . . . . .	17	1923	Holl.	Rotterdam Lloyd . . . . .	482-5	62-0	35-6
11,628	Australia (M.) . . . . .	—	1928	U.S.	Texas S.S. Co. . . . .	509-7	64-2	39-9
11,622	Hikawa Maru (M.) . . . . .	17	1930	Jap.	Nippon Yusen Kaisha . . . . .	510-0	66-0	41-0
11,621	Hiye Maru (M.) . . . . .	17	1930	Jap.	Nippon Yusen Kaisha . . . . .	512-6	66-0	41-0
11,616	Helan Maru (M.) . . . . .	17	1930	Jap.	Nippon Yusen Kaisha . . . . .	511-6	66-0	41-0
11,590	General Osorio (M.) . . . . .	15	1928	Ger.	Hamburg-Amerika Line . . . . .	498-5	66-0	32-8
11,555	Northumberland (T.) . . . . .	15	1915	Br.	Federal Stm. Nav. Co. . . . .	530-5	63-0	31-9
11,520	Oriente (T.E.) . . . . .	20	1930	U.S.	Atlantic, Gulf & W. Indies Lines . . . . .	508-0	70-9	39-0
11,518	Kaisar-i-Hind . . . . .	17	1914	Br.	P. & O. . . . .	520-0	61-2	33-1
11,469	Sierra Cordoba . . . . .	14	1923	Ger.	Norddeutscher Lloyd . . . . .	490-5	61-8	34-3
11,453	Worcestershire (M.) . . . . .	15†	1931	Br.	Bibby Line . . . . .	483-0	64-2	32-0
11,449	Tuscan Star (M.) . . . . .	16	1930	Br.	Blue Star Line . . . . .	471-0	68-3	35-1
11,439	Transbalt . . . . .	12	1899	Russ.	Soviet Merchantile Fleet . . . . .	501-1	62-2	46-3
11,431	Philoctetes (T.) . . . . .	14	1922	Br.	Blue Funnel Line . . . . .	511-9	63-2	41-1
11,430	Der Deutsche . . . . .	14	1924	Ger.	Norddeutscher Lloyd . . . . .	490-5	61-8	34-3
11,414	Jean Labordé (M.) . . . . .	16	1930	Fr.	Messageries Maritimes . . . . .	463-6	61-8	28-3
11,410	Victolite (M.) . . . . .	—	1928	Br.	Imperial Oil . . . . .	510-2	68-2	38-0
11,405	Esperia (T.) . . . . .	21	1918	Ital.	Lloyd Trestino . . . . .	492-1	61-7	34-1
11,404	Vancolite (M.) . . . . .	—	1928	Br.	Imperial Oil . . . . .	510-2	68-2	38-0
11,404	Achilles (T.) . . . . .	14	1920	Br.	Blue Funnel Line . . . . .	507-4	63-2	41-1
11,395	Harry G. Seidel (M.) . . . . .	—	1930	Danzig	Baltisch-Amer. Petrol. Import . . . . .	513-2	68-1	39-4
11,392	Sierra Ventana . . . . .	14	1923	Ger.	Norddeutscher Lloyd . . . . .	490-5	61-8	34-3
11,383	Remuera . . . . .	14	1911	Br.	New Zealand Shipping Co. . . . .	485-0	62-3	41-0
11,375	Sphinx . . . . .	14	1914	Fr.	Messageries Maritimes . . . . .	478-0	60-7	40-6
11,361	Tyndareus . . . . .	13†	1916	Br.	Blue Funnel Line . . . . .	507-0	63-2	41-6
11,337	Cuba (T.) . . . . .	15†	1923	Fr.	C.G.T. (French Line) . . . . .	476-0	62-3	35-1
11,321	Sarpedon (T.) . . . . .	16	1923	Br.	Blue Funnel Line . . . . .	499-0	62-3	84-9
11,314	Patroclus (T.) . . . . .	15	1923	Br.	Blue Funnel Line . . . . .	498-8	62-3	26-4
11,309	Montrolite (M.) . . . . .	—	1926	Br.	Imperial Oil . . . . .	510-9	68-2	37-9
11,309	Canadolite (M.) . . . . .	—	1926	Br.	Imperial Oil . . . . .	510-0	68-0	38-0
11,299	Llanstephan Castle . . . . .	13†	1914	Br.	Union Castle Line . . . . .	500-5	63-3	37-2
11,256	Leopoldville . . . . .	14	1929	Belg.	Lloyd Royal Belge . . . . .	478-8	62-2	35-0
11,254	General Artigas (T.) . . . . .	13†	1923	Ger.	Hamburg-Amerika Line . . . . .	473-6	60-7	41-9
11,251	General San Martin (T.) . . . . .	13†	1922	Ger.	Hamburg-Amerika Line . . . . .	473-6	60-7	41-9
11,246	California Standard (M.) . . . . .	13	1929	U.S.	Standard Oil Co. of California . . . . .	513-5	68-1	39-5
11,231	Themistocles . . . . .	15	1911	Br.	Aberdeen Line . . . . .	500-6	8-2	39-4
11,198	Hector (T.) . . . . .	15	1924	Br.	Blue Funnel Line . . . . .	498-8	62-3	26-4
11,174	Antenor (T.) . . . . .	15	1925	Br.	Blue Funnel Line . . . . .	497-7	62-2	35-0
11,140	Jan Pieterszoon Coen . . . . .	15	1915	Holl.	Nederland Stoom. Maats. . . . .	503-5	60-6	35-8
11,103	Edison . . . . .	13	1896	Gr.	National Stm. Nav. Co. of Greece . . . . .	523-1	60-1	34-9
11,081	Achilles . . . . .	—	1915	U.S.	Panama Canal . . . . .	514-0	65-2	36-5
11,060	Nieuw Zeeland (T.) . . . . .	15	1928	Holl.	Koninkl. Paketv. Maats. . . . .	540-0	62-5	33-4
11,057	Nieuw Holland (T.) . . . . .	15	1927	Holl.	Koninkl. Paketv. Maats. . . . .	540-5	62-7	32-3
11,055	Drottningholm (T.) . . . . .	17	1905	Swed.	Svenska-Amerika Line . . . . .	517-0	60-0	38-0
11,028	Foucauld . . . . .	14	1922	Fr.	Charg-urs Réunis . . . . .	483-4	58-9	34-9
11,015	Bergensfjord (T. & R.) . . . . .	17†	1913	Nor.	Norske-Amerika Line . . . . .	512-4	61-2	29-4
11,000	Dorset (M.) . . . . .	—	1934	Br.	Federal Stm. Nav. Co. . . . .	493-5	68-6	42-9
11,000	Durham (M.) . . . . .	—	1934	Br.	Federal Stm. Nav. Co. . . . .	493-5	68-6	42-9
10,957	Mantua . . . . .	16	1909	Br.	P. & O. . . . .	540-0	61-3	24-6
10,948	Norfolk (T. & R.) . . . . .	14	1918	Br.	Federal Stm. Nav. Co. . . . .	520-7	64-2	38-1

\* † See notes on p. 327.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed ↑ (knots).	Date built.	Flag.	Owners.	L. * (ft.)	B. * (ft.)	D. * (ft.)
10,946	Huntingdon (T. & R.)	14	1920	Br.	Federal Stm. Nav. Co.	520-7	64-2	38-1
10,940	Cornwall (T.)	14	1920	Br.	Federal Stm. Nav. Co.	495-1	63-1	40-3
10,938	Cumberland (T. & R.)	14	1919	Br.	Federal Stm. Nav. Co.	520-0	64-2	39-0
10,936	Fushimi Maru	14½	1914	Jap.	Nippon Yusen Kaisha	513-0	63-5	37-5
10,926	Eastern Prince (M.)	17	1929	Br.	Prince Line	496-2	64-8	35-4
10,926	Western Prince (M.)	17	1929	Br.	Prince Line	496-2	64-8	35-4
10,923	Hertford (T. & R.)	14	1917	Br.	Federal Stm. Nav. Co.	520-7	64-2	38-1
10,917	Northern Prince (M.)	17	1929	Br.	Prince Line	496-2	64-9	35-9
10,917	Southern Prince (M.)	17	1929	Br.	Prince Line	496-2	64-9	35-9
10,902	City of Paris (T.)	14½	1922	Br.	City Line	484-7	59-3	32-6
10,893	Chief Capilano	13	1920	Br.	Canadian-American Nav. Co.	523-5	65-7	37-5
10,893	Durham (M.)	—	1934	Br.	Federal Stm. Nav. Co.	498-5	68-6	34-5
10,890	Rotorua	15	1911	Br.	Federal Stm. Nav. Co.	526-4	61-4	33-3
10,870	Rueahine	14	1909	Br.	New Zealand Shipping Co.	480-6	60-3	32-1
10,852	Monowai (T. & R.)	20	1925	Br.	Union Royal Mail Line	500-4	63-2	34-0
10,846	Cambridge	14	1916	Br.	Federal Stm. Nav. Co.	524-5	65-7	37-3
10,836	Tjibesar (T.)	12	1922	Holl.	Java-China-Japan Line	500-1	63-7	39-2
10,833	Cristobal Colon (T.)	17	1922	Sp.	Cia. Transatlantica	499-4	61-0	32-3
10,825	Indrapoera (M.)	16½	1925	Holl.	Rotterdam Lloyd	479-5	60-2	35-1
10,816	Campana (T.)	15	1929	Fr.	Soc. Gen. de Transport Mar. & Vap.	510-6	67-0	32-1
10,800	Manoora (M.)	—	1934	Br.	Adelaide S.S. Co.	463-5	66-2	20-3
10,800	Imperial Star (M.)	—	1934	Br.	Blue Star Line	516-7	70-0	43-3
10,786	Llandaff Castle	14	1926	Br.	Union Castle Line	471-1	61-7	31-0
10,784	Waipawa (M.)	—	1934	Br.	Shaw, Savill & Albion	516-2	70-4	32-4
10,782	Waiwera (M.)	—	1934	Br.	Shaw, Savill & Albion	429-5	70-4	32-4
10,782	Colombia (M.)	15	1930	Holl.	Koninkl. Nederlandsche S.M.	514-0	61-7	36-0
10,780	Ulysses	—	1915	U.S.	American Tankers Corp.	494-1	65-2	36-5
10,769	Albertville	14	1928	Belg.	Lloyd Royal Belge	516-6	62-0	24-0
10,700	Wairangi (M.)	—	1934	Br.	Shaw, Savill & Albion	516-2	70-2	39-1
10,672	Suwa Maru	14½	1914	Jap.	Nippon Yusen Kaisha	516-0	62-6	34-9
10,654	Staffordshire (M.)	15½	1928	Br.	Bibby Line	483-6	62-3	32-0
10,609	Llandovery Castle	14	1925	Br.	Union Castle Line	471-1	61-7	39-0
10,583	Napier Star (T.)	15	1927	Br.	Blue Star Line	476-0	67-3	36-6
10,560	Shropshire (M.)	15½	1926	Br.	Bibby Line	483-6	60-3	31-5
10,560	Cheshire (M.)	15½	1927	Br.	Bibby Line	483-6	60-3	31-5
10,551	Habana (T.)	17	1921	Sp.	Cia. Transatlantica	480-0	61-0	32-3
10,533	President Hayes	14	1920	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,533	President Monroe	14	1920	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,533	President Van Buren	14	1920	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,517	Danmark (M.)	—	1931	Dan.	A/S. Dampsks. "Myren"	489-5	67-5	37-7
10,516	President Adams	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,504	President Harrison	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,502	Guadeloupe	13½	1908	Fr.	C.G.T. (French Line)	508-4	57-8	39-5
10,500	President Polk	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,495	President Garfield	14	1921	U.S.	Dollar S.S. Lines	502-1	62-2	28-3
10,480	Lemoyne	—	1926	Br.	Canada S.S. Line	621-1	70-2	25-4
10,474	Johan de Witt	16	1920	Holl.	Nederland Stoom. Maats.	482-2	59-2	34-8
10,421	Haruna Maru (T.)	15½	1922	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,420	Hakone Maru (T.)	15½	1921	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,413	Hakozaiki Maru (T.)	15½	1922	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,409	Pan Gotyla (M.)	—	1931	Swed.	Rederi A/B Pagote	504-4	64-2	38-6
10,388	Bacon	—	1921	U.S.	Texas S.S. Co.	500-0	68-2	29-3
10,388	Bacon	—	1921	U.S.	Standard Shipping Co.	500-0	68-2	29-3
10,380	Hakusan Maru (T.)	15½	1923	Jap.	Nippon Yusen Kaisha	495-0	62-0	37-0
10,374	Diomed (T.)	14	1922	Br.	Blue Funnel Line	491-0	62-4	31-1
10,350	Orari (M.)	10	1931	Br.	New Zealand Shipping Co.	471'0	67-3	36-8
10,348	Uruguay (T. & R.)	17	1913	Sp.	Cia. Transatlantica	481-9	61-3	32-7
10,326	Wilhelm A. Riedemann (M.)	—	1920	Ger.	Wärtsilä Tankerschiff Rhederel	525-7	66-5	33-5
10,305	Calchas (T.)	14	1921	Br.	Blue Funnel Line	490-8	62-4	39-6
10,286	Perseus (T.)	14	1923	Br.	Blue Funnel Line	490-5	62-3	39-6
10,283	Menelaus (T.)	14	1923	Br.	Blue Funnel Line	495-5	62-3	39-6
10,268	Explorateur Granddier	13	1924	Fr.	Messageries Maritimes	455-8	60-7	41-1
10,263	Ixion	12½	1912	Br.	Blue Funnel Line	506-0	60-3	39-5
10,254	Talithybius	13	1912	Br.	Blue Funnel Line	506-0	60-3	39-5
10,227	Tamiahua	—	1921	U.S.	Richfield Oil Co. of California	500-0	71-2	31-2
10,224	Europa (M.)	15	1931	Dan.	East Asiatic Co.	465-4	62-2	37-2
10,220	Delitzschi (M.)	15	1929	Holl.	Holland-Amerika Line	490-9	64-7	34-1
10,208	Gulfbird (M.)	—	1928	U.S.	Gulf Refining Co.	511-7	89-5	36-7
10,208	Gulfbird (M.)	—	1928	U.S.	Gulf Refining Co.	511-7	69-5	36-7
10,198	Kraljica Marija	15	1906	Jugosl.	Jugoslavenski Lloyd	515-2	61-3	30-5
10,193	Brazza (M.)	13½	1923	Fr.	Chargeurs Réunis	453-1	59-1	36-1
10,191	Gretafeld	—	1928	Br.	N. Petroleum Tank S.S. Co.	500-2	67-9	36-9
10,183	Yorkshire (T.)	15	1920	Br.	Bibby Line	482-4	58-3	40-4
10,171	Flandria (T.)	14½	1922	Holl.	Holland Lloyd	450-1	59-2	41-7
10,155	Damsterdijk (M.)	15	1930	Holl.	Holland-Amerika Line	490-9	64-7	34-1

\* ↑ See notes on p. 327.

## LARGEST MERCHANT VESSELS OF THE WORLD—continued.

Gross tonnage.	Name.	Speed. <sup>†</sup> (knots).	Date built.	Flag.	Owners.	L. <sup>*</sup> (ft.)	B. <sup>*</sup> (ft.)	D. <sup>*</sup> (ft.)
10,137	Argentina (T. & R.) . . . . .	17	1913	Sp.	Cia. Trasatlantica . . . . .	480·0	61·8	40·7
10,136	Kent of Nagpur . . . . .	14	1922	Br.	City Line . . . . .	469·9	59·3	40·0
10,123	Kerguelen (T.) . . . . .	13 <sup>‡</sup>	1922	Fr.	Chargeurs Réunis . . . . .	484·2	59·3	35·0
10,123	Jamaïque (T.) . . . . .	13 <sup>‡</sup>	1922	Fr.	Chargeurs Réunis . . . . .	484·2	59·3	27·2
10,110	Amerika (M.) . . . . .	15	1930	Dan.	East Asiatic Co. . . . .	465·4	62·2	37·2
10,107	Opawa (M.) . . . . .	16	1931	Br.	New Zealand Shipping Co. . . . .	471·0	67·3	36·8
10,107	Sourabaya . . . . .	12	1915	Br.	South Georgia Co. . . . .	470·2	58·3	32·2
10,093	Doric Star (T.) . . . . .	13	1921	Br.	Blue Star Line . . . . .	499·8	64·0	37·0
10,080	Bernardin de Saint Pierre (T.) . . . . .	13	1925	Fr.	Messageries Maritimes . . . . .	455·8	60·8	41·0
10,078	Arctic Queen . . . . .	12	1909	Br.	Hellyer Bros. . . . . .	486·0	59·3	27·4
10,061	Commissaire Ramel (T. & R.) . . . . .	12 <sup>‡</sup>	1920	Fr.	Messageries Maritimes . . . . .	478·8	59·2	33·4
10,058	Aeneas . . . . .	13 <sup>‡</sup>	1910	Br.	Blue Funnel Line . . . . .	493·0	60·4	28·6
10,052	Tōa Maru (M.) . . . . .	—	1934	Jap.	Iino Shoji K.K.. . . . .	500·0	65·0	37·0
10,048	Ascanius . . . . .	13 <sup>‡</sup>	1910	Br.	Blue Funnel Line . . . . .	493·0	60·4	28·6
10,048	Otalo (M.) . . . . .	16	1930	Br.	New Zealand Shipping Co. . . . .	472·2	67·2	35·7
10,044	Koll (M.) . . . . .	—	1930	Nor.	Odd Bergs Tankrederi . . . . .	487·4	66·0	37·3
10,042	Beaverford (T.) . . . . .	15 <sup>‡</sup>	1928	Br.	Canadian Pacific . . . . .	503·0	61·8	37·6
10,041	Beaverhill (T.) . . . . .	15 <sup>‡</sup>	1928	Br.	Canadian Pacific . . . . .	503·0	61·8	37·6
10,028	Carl D. Bradley (T.E.) . . . . .	—	1927	U.S.	Bradley Transportation Co. . . . .	623·2	65·2	30·2
10,006	Tilawa . . . . .	12	1924	Br.	British India S.N. Co. . . . .	451·0	59·3	36·8
10,002	Dunbar Castle (M.) . . . . .	14 <sup>‡</sup>	1930	Br.	Union Castle Line . . . . .	471·2	61·2	29·6
10,000	Anchises . . . . .	13 <sup>‡</sup>	1911	Br.	Blue Funnel Line . . . . .	493·0	60·4	28·6
10,000	Talma . . . . .	12	1923	Br.	British India S.N. Co. . . . .	451·0	59·3	36·8

<sup>†</sup> \* See notes on p. 327.

## NUMBERS OF VESSELS CLASSED BY VARIOUS CLASSIFICATION SOCIETIES.\*

Society.	1918.	1919.	1923.	1925.	1928.	1932.	1934.
Lloyd's Register . . . . .	10,466	9175	10,296	9978	10,077	10,575	9606
British Corporation . . . . .	876	1002	1306	1253	1417	1602	1491
American Record of American and Bureau of Foreign Shipping . . . . .	846	926	2392	2181	1928	1863	1671
Shipping Gt. Lakes Register . . . . .	572	442	416	383	388	359	349
Bureau Veritas . . . . .	5165	5706	4998	5135	5097	5113	4981
Norske Veritas . . . . .	1604	955	1242	1220	1807	1399	1351
Registro Italiano . . . . .	1442	699	1872	1826	1693	2243	2367
Germanischer Lloyd . . . . .	2848	†	2799	2855	2914	3034	2869

\* Many vessels are not exclusively classed in one Register.

† No data available.

## FASTEST MERCHANT VESSELS OF THE WORLD.†

Speed (knots).	Name.	Gross Tonnage.	Date built.	Flag.	Owners.	L.° (ft.)	B.° (ft.)	D.° (ft.)
26 and over	Rex . . . . .	51,062	1932	Ital.	Italia Line	879·9	97·0	80·7
	Conte di Savoia . . . . .	48,502	1932	"	Norddeutscher Lloyd	814·6	96·1	82·4
	Bremen . . . . .	51,656	1929	German	"	898·7	101·9	48·2
	Europa . . . . .	49,746	1928	"	"	890·2	102·1	48·0
25 and under 26	Majestic . . . . .	56,599	1921	British	Cunard White Star	915·5	100·1	58·2
	Mauretania . . . . .	30,896	1907	"	L.M.S. Railway Co.	762·2	88·0	57·1
	Anglia . . . . .	3,460	1920	"	"	380·5	45·2	17·2
	Hibernia . . . . .	3,467	1920	"	"	380·6	45·2	17·2
	Cambria . . . . .	3,462	1921	"	"	380·5	45·2	17·2
	Scotia . . . . .	3,454	1921	"	"	380·5	45·2	17·2
	Brighton . . . . .	2,891	1933	"	Southern Railway Co.	298·1	88·6	22·7
	Worthing . . . . .	2,294	1928	"	"	297·7	38·7	15·0
24 and under 25	Paris . . . . .	1,790	1913	"	"	293·5	35·6	15·2
	Empress of Britain . . . . .	42,348	1931	"	Canadian Pacific Railway	733·3	97·8	56·0
	Leviathan . . . . .	48,943	1914	U.S.	United States Lines	907·6	100·3	58·2
	Versailles . . . . .	2,156	1919	French	French State Railways (Southern Railway Co.)	300·6	36·1	21·4
23 and under 24	Rouen . . . . .	1,882	1912	"	"	292·0	34·6	22·1
	Berengaria . . . . .	52,101	1912	British	Cunard White Star	883·6	98·3	57·1
	Aquitania . . . . .	45,647	1914	"	"	868·7	97·0	49·7
	Ile de France . . . . .	43,450	1926	French	Cie. Gen. Transatlantique	768·7	92·0	55·9
	Maid of Orleans . . . . .	2,386	1918	British	Southern Railway Co.	341·1	42·1	16·0
	Newhaven . . . . .	1,888	1911	French	French State Railways (Southern Railway Co.)	292·0	34·6	22·1
	H. F. Alexander . . . . .	8,357	1915	U.S.	Admiral Line	500·5	63·1	21·0
	Monticello . . . . .	19,361	1902	"	U.S. Shipping Board	684·3	72·3	40·2
	Mount Vernon . . . . .	18,372	1906	"	"	685·4	72·2	40·5
	Prince Baudouin . . . . .	3,050	1934	Belg.	Belgian Government	357·0	49·1	21·1
	Prince Charles . . . . .	2,988	1930	"	"	347·0	46·2	22·8
	Prince Leopold . . . . .	2,988	1930	"	"	347·0	46·2	22·8
	Prinses Astrid . . . . .	2,986	1930	"	"	347·0	46·2	22·8
	Prinses Josephine Charlotte . . . . .	2,988	1931	"	"	347·0	46·2	22·8
	Princesse Marie José . . . . .	1,821	1922	"	"	348·0	40·0	29·8
22 and under 23	Olympic . . . . .	46,439	1911	British	Cunard White Star	852·5	92·5	59·5
	Ben-my-Chree . . . . .	2,586	1927	British	Isle of Man Stm. Packet Co.	355·0	46·1	17·4
	Viking . . . . .	1,957	1905	"	"	360·4	42·0	16·1
	Biarritz . . . . .	2,388	1915	"	Southern Railway Co.	341·2	42·1	24·0
	Canterbury . . . . .	2,910	1929	"	"	329·6	47·1	16·9
	Isle of Thanet . . . . .	2,701	1925	"	"	329·5	45·1	47·1
	Maid of Kent . . . . .	2,693	1925	"	"	329·5	45·1	17·1
	Prinses Julianas . . . . .	2,908	1920	Dutch	"	350·4	42·7	23·9
	Mecklenburg . . . . .	2,907	1922	"	"	350·4	42·7	23·9
	Oranje Nassau . . . . .	2,885	1909	"	"	350·0	42·7	16·4
	Wahine . . . . .	4,436	1913	British	Union S.S. Co. of N.Z.	375·0	52·2	25·6
	Prince David . . . . .	6,892	1930	"	"	366·4	57·1	18·9
	Prince Henry . . . . .	6,893	1930	"	"	366·4	57·1	27·4
	Prince Robert . . . . .	6,892	1930	"	"	366·4	57·1	27·4
	Malolo . . . . .	17,232	1927	U.S.	Matson Navigation Co.	554·0	83·2	30·7
	Mariposa . . . . .	18,017	1931	"	Oceanic S.S. Co.	604·0	79·3	30·5
	Lurline . . . . .	18,021	1932	"	"	604·0	79·3	30·5
	Monterey . . . . .	18,017	1932	"	"	604·0	79·3	30·5
	Rangatira . . . . .	6,152	1931	British	Union Royal Mail Line	406·1	58·2	25·8
	Lady of Mann . . . . .	3,104	1930	"	Isle of Man Stm. Packet Co.	363·6	50·2	17·4
	Lairds Isle . . . . .	1,788	1911	"	Burns & Laird Lines	316·0	41·1	15·8
	Victoria . . . . .	18,068	1931	Ital.	Lloyd Triestino	540·6	69·9	30·9
	Corregidor . . . . .	1,786	1911	U.S.	Cia. Maritima	316·0	41·1	15·8

\* Registered dimensions; see notes on p. 327.

† The speeds used in compiling this table are as given by the owners.

## PARTICULARS OF FAST VOYAGES ON CERTAIN PASSENGER SERVICES.

## FAST VOYAGES.

335

Name of Vessel.	Owner.	Date of Voyage.	Ports between which Voyage was made.	Distance (Sea miles).	Time taken.	Average speed (Knots).	Best day's run (Knots).	Remarks.
Rex . . .	Italia Line.	Aug., 1933	Gibraltar to New York	3,181	4d. 13h. 58m.	28-92	736	
Bremen . .	Norddeutscher Lloyd	Nov., 1934	Cherbourg to New York*	—	4d. 15h. 27m.	—	—	
" "	"	July, 1929	New York to Cherbourg*	3,084	4d. 14h. 30m.	27-91	667	
" "	"	June, 1933	New York to Cherbourg*	3,199	4d. 16h. 15m.	28-51	—	* Cherbourg Break-water and Ambrose Channel Light Vessel.
Europa. . .	"	March, 1930	Cherbourg to New York*	3,157	4d. 17h. 6m.	27-91	704	
" "	"	May, 1930	New York to Cherbourg*	3,200	4d. 20h. 48m.	27-40	654	
Mauretania . .	Cunard White Star	Sept., 1910	Liverpool to New York \$	2,780	4d. 10h. 41m.	26-06	—	
" "	"	Aug., 1924	New York to Cherbourg*	3,198	5d. 1h. 49m.	26-25	626	† Ambrose Channel Light Vessel and Eddystone Light-house.
" "	"	Aug., 1929	Cherbourg to New York*	3,162	4d. 21h. 44m.	26-85	687	
" "	"	Aug., 1929	New York to Plymouth †	3,098	4d. 17h. 50m.	27-22	636	‡ Father Point and Bar Light Vessel.
" "	"	Aug., 1929	Plymouth to Cherbourg	106	—	29-7	—	§ Dams Rock and Sandy Hook Light-ship.
Majestic . . .	"	Sept., 1923	New York to Cherbourg*	3,104	5d. 5h. 21m.	24-76	613	
Laurentic . .	"	June, 1930	Quebec to Liverpool ‡	2,444	5d. 21h. 15m.	17-30	—	
Empress of Britain	Canadian Pacific Steamships.	Aug., 1934	Quebec (Father Point) to Cherbourg	—	4d. 6h. 58m.	25-08	—	Vessel did not deviate to Marseilles.
Empress of Japan China . . .	F. & O.	Apr., 1931	Yokohama to Vancouver	—	7d. 20h. 16m.	—	—	** Vessel called at Marseilles.
Viceroy of India	"	Sept. 26 to Oct. 14, 1919	London to Bombay	6,258	17d. 20h.	15-7	—	
Reina del Pacifico	Pacific Steam Navigation Co.	Sept. 17 to Oct. 3, 1932	London to Bombay	—	16d. 1h. 42m. **	17-92	—	
		June 18 to Aug. 17, 1931	Liverpool, Valparaiso, Liverpool, via Panama Canal	18,366	59d. 13h. (actual steaming 43d. 3h.)	17-47	458	

## DEVELOPMENT OF MARINE PROPELLING MACHINERY.

	Approximate Date of Introduction in the United Kingdom.			
	Merchant.		Naval.	
Compound engines . . .	—	1860	—	1865
Triple-expansion engines . . .	—	1880	—	1885
Quadruple-expansion do. . .	—	1890	Not fitted . . .	—
Cylindrical boilers . . .	—	1862	—	1869
Water-tube boilers . . .	Cross-channel . . .	1911	Destroyers . . .	1893
Direct turbines . . .	Ocean liners . . .	1914	Battleships . . .	1897
Combination engines and turbines . . .	Cross-channel . . .	1901	Destroyers . . .	1898
Combination machinery on common line shafting (Bauer-Wach) . . .	Ocean liners . . .	1905	Light cruisers . . .	1904
Geared turbines . . .	Intermediate liner .	1908	Battleships . . .	1906
High pressure turbines . .	Intermediate liner and cargo steamers .	1926	(For cruising only)	1902
Electric propulsion . . .	Single-reduction . .	1911	Single-reduction . .	1913
Oil fuel burning . . .	Double-reduction . .	1916	Not fitted . . .	—
Heavy oil engines . . .	Single-reduction . .	1926	Destroyers . . .	1926
Pulverised Coal Firing . . .	First attempts . . .	1904	Not fitted . . .	—
	Diesel-electric . . .	1913	—	—
	Turbo-electric . . .	1929	—	—
	(Large liner)			
	First attempts . . .	1870	Coal and oil— Destroyers . . .	1902
	Modern plant . . .	1892	Battleships . . .	1904
			Oil alone— Destroyers . . .	1910
			Battleships . . .	1913
	First attempts . . .	1904	Tender . . .	1914
	Modern plant . . .	1910	Submarines . . .	1908
	Double-acting . . .	1924	Subm. dep't ship .	1928
	Supercharging . . .	1925	—	—
	First attempts . . .	1928	—	—

MARINE ENGINES UNDER CONSTRUCTION IN THE WORLD  
(Recorded by Lloyd's Register of Shipping as at the end of September, 1938).

Country in which building.	Steam Engines.				Oil Engines.	Total.			
	Reciprocating.		Turbines.			No.	I.H.P.	No.	
	No.	I.H.P.	No.	S.H.P.		No.	I.H.P.	H.P.	
Gt. Britain & Ireland	66	87,673	14	314,880	70	249,940	150	652,493	
Denmark . . .	1	1,825	5	1,250	12	50,100	18	53,175	
France . . .	1	450	4	224,300	7	18,550	12	243,300	
Germany . . .	10	12,100	17	48,759	32	51,120	59	111,979	
Holland . . .	3	5,450	—	—	15	61,537	18	66,987	
Italy . . .	1	1,500	—	—	3	53,500	4	55,000	
Japan . . .	3	5,700	4	19,200	48	112,335	55	137,235	
Norway . . .	7	6,200	—	—	2	5,800	9	12,000	
Spain . . .	—	—	—	—	4	14,150	4	14,150	
Sweden . . .	—	—	—	—	83	82,732	83	82,732	
United States . . .	—	—	2	8,000	11	9,005	13	17,005	
Other Countries . . .	2	1,800	—	—	5	20,700	7	22,500	
Total . . .	94	122,698	46	616,389	292	729,469	432	1,468,556	

The horse-power is compiled from figures furnished by the engine makers.

## NUMBERS OF MERCHANT VESSELS USING THE VARIOUS TYPES OF PROPULSION.\*

(Excluding vessels of less than 100 tons gross.) As at June, 1934.

Country.	Oil Engines.	Steam Turbines.	Steam Recipro- cating Engines.	Auxiliary Steam Engines.	Auxiliary Oil Engines.	Sails.	Totals.
Great Britain and Ireland .	561	324	6,151	—	71	362	7,469
British Dominions . . . .	253	26	1,800	2	92	325	2,498
British Empire . . . .	814	350	7,951	2	163	687	9,967
United States . . . .	285	523	1,733	—	19	485	3,045
Belgium . . . . .	35	7	148	—	2	1	193
Denmark . . . . .	124	15	459	1	87	14	700
France . . . . .	110	72	1,238	1	38	108	1,567
Germany . . . . .	246	59	1,406	5	316	11	2,043
Greece . . . . .	3	2	535	—	10	—	550
Holland . . . . .	461	59	747	—	140	19	1,426
Italy . . . . .	142	48	749	3	89	211	1,242
Japan . . . . .	301	44	1,376	58	170	—	1,949
Norway . . . . .	375	9	1,455	16	49	4	1,908
Spain . . . . .	79	11	632	7	53	58	840
Sweden . . . . .	150	12	967	—	180	30	1,339
Other Countries . . . .	351	21	2,760	5	137	371	3,645
Total . . . .	3,476§	1,232†	22,156†	98	1,453	1,999	30,414

\* Excluding American Great Lakes vessels and Japanese sailing vessels.

† Includes 263 ships fitted with a combination of reciprocating and turbine engines.

‡ Includes 42 ships fitted with turbo-electric drive.

§ Includes 53 ships fitted with Diesel-electric drive.

## COMPARISON OF RUNNING COSTS OF STEAM- AND MOTORSHIPS.

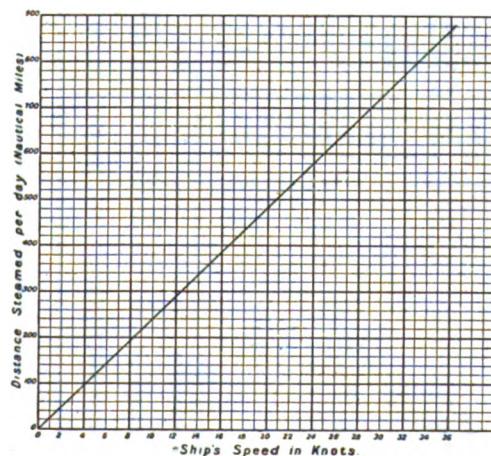
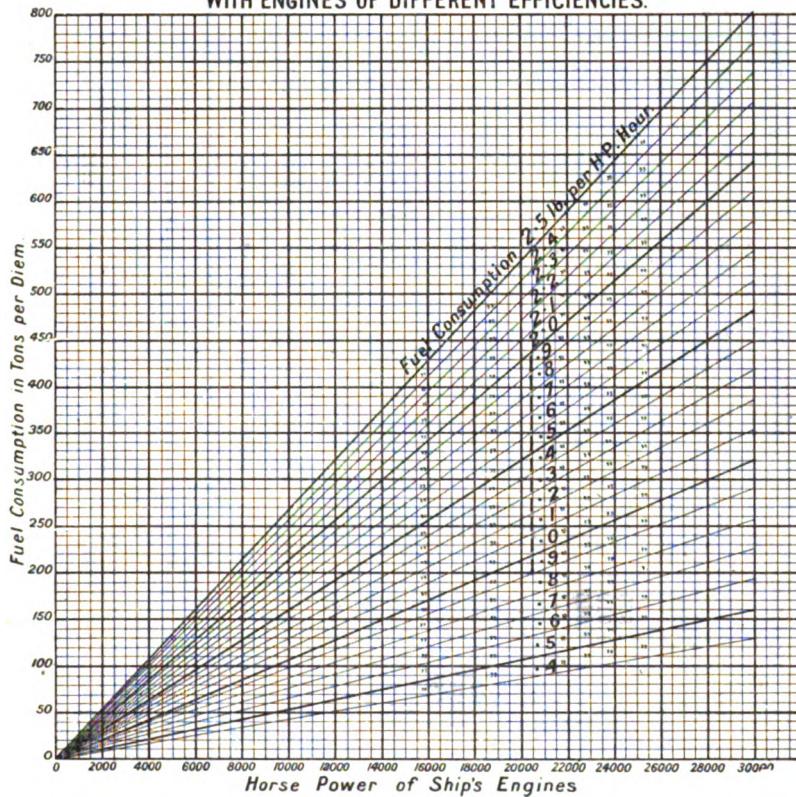
DEADWEIGHT CAPACITY, 8,000 TONS. SPEED, 10½ KNOTS. VOYAGE, 30 DAYS.

Type of Machinery	S.S. Diesel 2,200 B.H.P.	S.S. Geared Turbines. 2,200 S.H.P.	S.S. Recip. 2,500 I.H.P.	S.S. Recip. Bauer Wach 2,500 I.H.P.
Fuel . . . . .	Oil.	Coal.	Coal.	Coal.
Fuel 163/h.p. hour . . .	0·4	1·56	1·65	1·25
„ tons day . . . .	9·4	36·7	44·2	38·4
„ voyage . . . .	282	1,101	1,926	1,005
Price, fuel/ton . . . .	£8 5s.	£1 5s.	£1 5s.	£1 5s.
Cost/voyage . . . .	£916 10s.	£1,376 5s.	£1,657 10s.	£1,256 5s.
Lub. oil, galla./day . . .	14	6	4	6
„ cost/gall. . . .	2s. 2d.	2s. 2d.	1s. 9d.	2s. 2d.
„ voyage . . . .	£45	£19 10s.	£10 10s.	£19 10s.
E.R. staff . . . .	8	21	21	21
Wages/voyage . . . .	£151	£228 10s.	£228 10s.	£228 10s.
Provision/voyage . . . .	£30	£78 15s.	£78 15s.	£78 15s.
Wages, fuel, lub. oil, and provisions/voyage . . . .	£1,182 10s.	£1,708	£1,975 5s.	£1,583
Running costs—Ratio . .	1	1·5	1·74	1·4
Comparative cost—				
Fuel winches/harbour .	£23 10s. (electric)	£96 5s. (steam)	£96 5s. (steam)	£96 5s. (steam)

## NOTABLE MOTORSHIPS.

Date.	Name.	Gross tonnage.	Dimensions. (ft.)	Owners.	Builders.	Machinery makers.	Type of engine.	Cycle.	No. of eng.	Total B.H.P.	Revs. per min.
1912	Juno	2,345	257·6×43·1×18·6	Nederl. Indische TANK-stoomboot Maats.	Werkspoor	4 single act.	1	1,100	125		
1918	Aba	7,937	450·5×55·8×36·6	Elder Dempster	Harland & Wolff	4 single act.	2	5,250	115		
1922	Pacific Commerce	5,089	420·0×54·0×25·0	Furness Withy	Doxford	2 opposed pistons	1	2,700	77		
1923	Brazza	10,193	453·1×59·1×36·1	Chargeurs Réunis	Sulzer	2 single act.	2	3,400	85		
1924	Dolius	5,994	407·0×52·2×28·4	A. Holt & Co.	Still	2 double act.	2	2,500	120		
1924	Aorangi	17,491	580·1×72·2×43·4	Canadian Australian Line	Scott's S.B. & E. Co.	2 single act.	4	13,000	135		
1925	Gripsholm	17,544	553·0×74·4×37·7	Swedish-American Line	Fairfield S.B. & E. Co.	4 double act.	2	13,500	125		
1926	Carnarvon Castle	20,063	630·7×73·5×41·5	Union Castle	Armstrong Whitworth & Wolff	4 dbl. act.	2	13,000	105		
1927	Saturnia	23,940	631·4×79·8×29·5	Coolich Line	Harland & Wolff	4 dbl. act. with super chargers	2	20,000	125		
1927	Augustus	30,418	710·9×82·8×46·5	Italia Line	M.A.N. & M.A.N.	2 double act.	4	25,000	120		
1928	Kungsholm	20,223	594·9×78·2×37·8	Swedish-American Line	Cant. Off. Savoia	4 double act.	2	15,000	100		
1930	Britannic	26,943	683·6×82·4×48·6	Cunard White Star	Burmeister & Wain	4 double act.	2	20,000	110		

DAILY FUEL CONSUMPTION OF STEAMERS & MOTOR SHIPS  
WITH ENGINES OF DIFFERENT EFFICIENCIES.



**DISTANCE STEAMED IN ONE DAY  
BY SHIPS OF DIFFERENT SPEEDS.**

NATIONALITY AND NET TONNAGE OF VESSELS, ENTERED AND CLEARED WITH CARGOES, IN THE FOREIGN TRADE  
OF THE UNITED KINGDOM FOR 1913, 1932, AND 1933.  
(Thousands of Net Tons.)

Nationality.	Entrances.				Clearances.				Percentage Clearances.			
	1913.		1932.		1913.		1932.		1913.		1932.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
British Foreign :—	32,292	35,521	36,384	40,101	4,683	1,869	2,067	67	5·1	5·3	6·9	3·4
Norwegian	· · ·	3,285	3,009	3,174	4,683	1,019	1,179	1·5	3·6	0·5	1·8	3·7
American	· · ·	724	2,119	1,189	370	1,016	1,476	1,599	3·9	3·4	4·5	2·1
Swedish	· · ·	1,891	1,906	2,042	3,016	2,536	2,537	2,672	3·5	4·9	5·2	2·9
Dutch	· · ·	1,702	2,937	3,110	2,636	2,537	2,672	3·5	4·9	5·2	3·7	4·6
Danish	· · ·	1,161	1,927	2,033	2,613	1,950	2,103	2·4	3·4	3·9	3·5	3·8
French	· · ·	999	1,881	1,979	1,975	2,805	2,985	2·0	3·2	3·3	2·9	4·7
Belgian	· · ·	1,369	1,121	1,080	957	1,067	1,048	2·8	1·9	1·8	1·4	5·3
Japanese	· · ·	140	689	489	282	684	662	0·3	1·1	0·8	0·4	1·9
Spanish	· · ·	1,060	592	502	1,694	1,008	784	2·2	1·0	0·8	2·5	1·0
Italian	· · ·	122	474	618	955	867	767	0·2	0·8	1·0	1·4	1·4
Russian	· · ·	678	*	*	937	*	*	1·4	*	1·4	*	*
Greek	· · ·	221	334	492	1,072	730	765	0·4	0·6	0·8	1·6	1·3
German	· · ·	3,166	4,659	4,371	5,730	3,030	3,110	6·4	7·8	7·2	8·5	5·6
Austro-Hungarian	· · ·	128	*	*	715	*	*	0·3	*	1·0	*	*
Other Nationalities	· · ·	125	2,227	2,985	185	1,829	2,304	0·2	3·8	4·9	0·3	3·3
Total Foreign	· · ·	16,772	23,849	25,064	27,720	20,591	21,795	34·2	40·2	41·5	40·9	39·2
Total British and Foreign	· · ·	49,064	59,370	60,428	67,821	55,441	55,637	100·0	100·0	100·0	100·0	100·0

\* Included in "Other Nationalities."

	Entrances and Clearances.				Percentages.			
	1913.		1932.		1913.		1932.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
British Foreign	· · ·	72,393	70,371	69,206	62	61·3	59·6	50·4
Total	· · ·	44,492	44,440	46,859	38	38·7	38·7	40·0
	116,886	114,811	116,086	100	100·0	100·0	100·0	100·0

ENTRANCES AND CLEARANCES IN THE FOREIGN TRADE OF THE  
UNDERMENTIONED COUNTRIES FOR THE YEARS 1913, 1932, AND  
1933.

Note.—C=With Cargo only.

C &amp; B=With Cargo and in Ballast

Countries.		Entrances.			Clearances.		
		1913.	1932.	1933.	1913.	1932.	1933.
United Kingdom	C	49,068	56,064	60,420	67,824	53,388	55,632
United States } of America }	C	33,924	47,568	44,580	44,484	50,712	48,912
France	C	34,512	52,644	54,012	26,112	44,496	45,024
Japan	C & B	24,720	53,964	59,256	24,900	53,988	59,184
Netherlands	C	17,148	18,732	19,584	11,016	13,392	13,344
Spain	C	11,605	16,368	15,084	23,484	23,184	23,208
British India	C	6,700	7,044	7,212	8,256	7,380	7,644
Australia	C & B	5,364	5,760	6,000	5,232	5,664	5,964
South Africa	C & B	5,352	4,764	5,004	5,280	4,764	4,908
Norway	C	3,756	4,212	4,260	4,740	3,744	3,888
Belgium	C & B	16,908	24,312	25,416	16,896	24,252	25,548
Sweden	C	13,764	12,876	13,200	17,004	11,460	12,876
Italy	C & B	18,720	19,668	20,688	18,948	19,188	20,064

## ABOVE AS PERCENTAGES OF 1913 FIGURES.

United Kingdom	100	114	123	100	79	82
United States of America }	100	140	131	100	114	110
France	100	153	157	100	170	172
Japan	100	218	240	100	217	238
Netherlands	100	109	114	100	122	121
Spain	100	141	130	100	98	99
British India	100	105	108	100	89	93
Australia	100	107	112	100	108	114
South Africa	100	89	93	100	90	93
Norway	100	112	113	100	79	82
Belgium	100	144	150	100	144	151
Sweden	100	94	96	100	67	76
Italy	100	105	111	100	106	106

NUMBER AND NET TONNAGE OF VESSELS THAT PASSED THROUGH THE SUEZ CANAL IN THE  
YEARS 1913, 1931, 1932, AND 1933, DISTINGUISHING THE PRINCIPAL NATIONALITIES.

Nationality of Vessels.	Number of Passages.				Net Tonnage of Vessels.				Numbers <sup>as</sup> Percentages of Total.				Tonnages as Percentages of Total.			
	1913.	1931.	1932.	1933.	1913.	1931.	1932.	1933.	1913.	1931.	1932.	1933.	1931.	1932.	1933.	
British . . . . .	2951	2976	2787	2974	12,052	484	16,624	852	15,721	294	16,733	484	58.0	55.5	54.8	55.4
Japanese . . . . .	68	196	262	253	343	732	1,153	133	1,439	626	1,394	104	1.3	9.6	5.2	4.7
Dutch . . . . .	342	444	342	319	1,287	354	2,848	368	2,364	185	2,405	878	6.7	8.3	6.4	6.4
French . . . . .	256	354	322	921	927	787	2,084	035	2,089	617	2,089	617	5.0	6.6	5.9	6.6
Italian . . . . .	110	286	316	329	290	576	1,424	095	1,609	119	1,760	094	2.2	5.3	6.3	6.1
Danish . . . . .	56	70	79	79	171	848	366	532	437	938	435	688	1.1	1.3	1.5	0.9
Norwegian . . . . .	44	151	179	284	93	313	745	740	860	956	1,443	381	0.9	2.8	3.6	5.2
American (U.S.) . . . . .	8	103	82	76	7,476	624	535	525	712	481	921	0.2	1.9	1.4	—	2.1
Swedish . . . . .	33	79	91	106	122	057	383	254	411	398	510	323	0.7	1.5	2.0	0.6
Greek . . . . .	17	25	32	83	54	500	52	609	77	753	274	308	0.3	0.5	0.6	1.5
Spanish . . . . .	26	—	—	75	643	—	—	—	—	—	0.5	—	—	0.4	—	—
German . . . . .	778	568	431	468	3,352	287	3,314	750	2,505	826	2,789	862	16.3	10.6	8.6	16.7
Austria-Hungarian . . . . .	216	—	—	—	845	830	—	—	—	—	—	—	4.8	—	—	4.2
Russian . . . . .	110	62	78	76	340	595	175	494	274	935	285	676	2.2	1.1	1.5	1.4
All others . . . . .	40	52	21	26	67	422	231	069	75	222	111	316	0.8	1.0	0.4	0.5
Total . . . . .	5085	5366	5032	5423	20,033	802	30,027	966	28,340	290	30,676	672	100.0	100.0	100.0	100.0

Note.—The above figures include not only Merchant Vessels and Mail Steamers, but also Warships and Transports as well as Government Chartered Vessels.

NUMBER AND NET TONNAGE OF COMMERCIAL VESSELS THAT PASSED THROUGH THE PANAMA CANAL IN THE YEARS ENDED 30TH JUNE, 1920,  
1924, 1926, 1928, 1930, 1932, 1933, AND 1934, DISTINGUISHING THE PRINCIPAL NATIONALITIES.

Note.—Commercial Vessels include all Vessels except those of the United States Government, or chartered by the U.S. Government to carry  
Government supplies, and Vessels of less than 10 tons measurement.

Nationality.	Number of Vessels.						Net Tonnage of Vessels.										
	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.	
British American (U.S.A.)*	753	1,205	1,423	1,842	1,536	1,054	1,039	2,760	188	2,760	188	7,039	5,42	8,976	9,90	8,006,962	
American (U.S.A.)*	1,129	2,197	2,432	2,753	2,885	1,917	1,686	2,369	3,791	3,058	3,058	15,806	3,99	12,563	2,56	13,752,957	
Norwegian†	—	—	—	—	—	—	—	338†	301	—	—	546	633	887	940	1,181,189	
Japanese	106	136	306	313	311	407	371	515	543	472	472	946,028	909,232	121,901	124,959	164,152	
Chilean	118	171	131	158	163	179	217	258	321	321	321	815,468	815,468	285,306	285,306	8,856	
Danish	79	47	26	32	46	5	7	7	113	135	135	245,929	245,929	121,901	124,959	164,152	
Peruvian	9	65	63	69	91	105	113	135	32,221	32,221	32,221	23,753	23,753	14,959	14,959	164,152	
Dutch	29	102	64	63	2	3	4	14	10,689	189,046	189,046	149,162	149,162	140,323	140,323	88,950	
French	83	90	127	124	81	80	91	152,535	651,761	630,652	630,652	644,390	644,390	671,250	671,250	563,315	
Spanish	60	45	31	46	9	—	92	114,864	386,640	421,752	421,752	580,719	580,719	454,836	454,836	535,315	
Other Nationalities	79	269	538	866	447	394	550	708	120,651	122,579	122,579	121,461	121,461	157,465	157,465	609,467	
Totals	• •	2,478	6,298	5,197	6,466	6,185	4,506	4,494	5,533	8,546,044	26,148,878	34,774,591	29,458,634	29,458,634	22,821,876	22,821,876	28,566,695

ABOVE AS PERCENTAGES.

Nationality.	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.
	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.
British American (U.S.A.)*	30.4	24.2	27.4	28.6	24.8	23.4	23.1	21.8	32.3	32.3	32.3	23.3	23.3	23.4	23.4	23.4
American (U.S.A.)*	45.0	56.3	46.8	42.6	46.7	42.5	37.5	41.0	44.4	60.5	50.7	46.7	46.7	48.5	45.7	44.8
German†	—	—	—	5.9	4.8	6.1	7.5	7.2	5.4	—	—	—	—	5.5	5.5	4.8
Norwegian†	4.3	2.6	3.3	2.5	2.9	2.6	4.0	4.0	4.7	2.1	4.0	4.0	4.0	5.6	6.5	4.4
Japanese	—	—	—	0.8	5.0	0.5	0.8	0.1	0.2	0.1	0.2	0.1	0.1	3.1	3.8	3.7
Chilean	—	—	—	0.3	1.2	1.2	1.5	2.4	2.4	2.4	2.4	0.4	0.4	0.5	0.5	0.4
Peruvian	—	0.3	1.3	1.2	0.8	0.1	0.1	0.1	0.1	0.3	0.3	0.7	0.7	1.0	1.3	0.1
Dutch	—	1.2	2.0	1.8	2.1	2.3	2.6	1.8	1.6	1.8	1.8	2.1	2.1	2.2	2.2	2.2
French	—	2.4	1.6	1.7	2.0	1.8	1.8	1.6	1.7	1.3	1.6	1.7	1.7	1.9	1.7	1.8
Spanish	—	1.6	0.9	6.0	0.7	0.0	0.0	—	1.2	0.7	0.6	0.5	0.5	0.0	0.0	0.0
Other Nationalities	3.2	5.8	0.5	13.9	7.2	8.7	12.2	12.8	3.2	4.4	6.7	9.1	9.1	5.6	6.2	7.3
Totals	• •	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

\* Includes Vessels engaged in the coasting trade of the U.S.A., which is carried on entirely by National Ships.  
† Included with "Other Nationalities" in previous years.

CARGOES (IN TONS WEIGHT) CARRIED IN COMMERCIAL VESSELS THAT PASSED THROUGH THE PANAMA CANAL DURING THE YEARS ENDED 30TH JUNE, 1920, 1924, 1926, 1928, 1930, 1932, 1933, AND 1934, DISTINGUISHING THE PRINCIPAL NATIONALITIES.

Nationality of Vessels.	Weight of Cargoes carried.							
	1920.	1924.	1926.	1928.	1930.	1932.	1933.	1934.
British . .	Tons. 2,830,268	Tons. 6,051,842	Tons. 6,750,843	Tons. 8,075,022	Tons. 7,572,969	Tons. 4,638,068	Tons. 4,170,995	Tons. 5,193,136
American (U.S.A.) . .	4,547,140	16,654,435	18,710,956	14,258,735	14,499,233	8,835,055	7,987,739	11,578,453
German . .	—	—	—	—	1,388,022*	1,078,738*	813,231*	962,218*
Norwegian . .	404,923	539,101	1,051,276	1,268,124	1,808,278	1,427,284	1,773,161	2,080,833
Japanese . .	726,338	935,245	667,982	1,041,166	1,009,735	1,031,704	1,159,733	1,510,916
Chilean . .	104,738	107,147	82,695	81,678	105,511	6,420	28,218	21,989
Danish . .	42,533	317,274	295,530	380,240	505,914	521,481	448,863	533,262
Peruvian . .	119,418	102,136	94,778	96,175	18,107	4,615	669	9,104
Dutch . .	128,442	573,929	552,741	637,178	618,718	440,870	381,071	403,451
French . .	125,249	407,249	398,393	600,421	576,753	338,786	249,395	430,668
Spanish . .	101,563	67,903	49,956	104,606	8,250	7,650	—	—
Other National- alities . .	244,487	1,238,449	2,382,298	3,097,364	1,923,742	1,477,327	1,164,653	1,994,621
Totals . .	9,374,499	26,994,710	26,087,448	29,630,709	30,030,232	19,807,998	18,177,728	24,718,651

## ABOVE AS PERCENTAGES.

	1920	1924.	1926.	1928.	1930.	1932.	1933.	1934.
British . .	80·2	22·4	25·9	27·2	25·2	23·4	22·9	21·0
American (U.S.A.) . .	48·5	61·7	52·7	48·2	48·3	44·6	43·9	46·8
German . .	—	—	—	—	4·6*	5·4*	4·5*	3·9*
Norwegian . .	4·8	2·0	4·0	4·3	6·0	7·2	9·8	8·4
Japanese . .	7·7	3·5	2·6	3·5	3·4	5·2	6·4	6·1
Chilean . .	1·1	0·4	0·3	0·3	0·4	0·0	0·1	0·1
Danish . .	0·5	1·2	1·1	1·3	1·7	2·6	2·5	2·2
Peruvian . .	1·3	0·4	0·4	0·3	0·0	0·0	0·0	0·0
Dutch . .	1·4	2·1	2·1	2·2	2·1	2·2	2·1	1·6
French . .	1·3	1·5	1·5	2·0	1·9	1·7	1·4	1·7
Spanish . .	1·1	0·3	0·2	0·3	0·0	0·0	—	—
Other National- alities . .	2·6	4·5	9·2	10·4	6·4	7·7	6·4	8·2
Totals . .	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

\* Included with "Other Nationalities" in previous years.

## FREIGHT RATES.

ESTIMATED AVERAGE RATES OF FREIGHT FOR STEAMERS IN THE OPEN MARKET, FOR VARIOUS YEARS.

OUTWARD.  
From Tyne and N.E. Coast ports.

HOMEWARD.  
To U.K. or Continent, except where otherwise stated.

To	OUTWARD.				HOMEWARD.							
	1921.	1924.	1928.	1931.	From	1921.	1924.	1928.	1931.	1932.	1933.	
	s. d.	s. d.	s. d.	s. d.		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
River Plate . .	19 10	13 0	12 3	9 7½	8 11½	River Plate (Lower Ports)	35 8	23 9½	20 14	16 10½	16 5½	14 5½
Port Said . .	15 4	10 11½	10 4½	6 8½	6 7	River Plate (San Lorenzo) .	45 1	25 9½	22 2	17 10	16 11½	15 10½
Alexandria . .	16 11	11 5	10 4	7 3½	6 11½	Gulf (per quarter)	6 10½	4 5½	4 2½	2 5½	2 2½	—
Barcelona . .	16 8	12 5½	11 11½	8 4	9 4½	Calcutta . .	25 0	30 1	—	—	—	—
Oporto . .	16 6	13 0	8 7	8 9½	8 9½	Karachi . .	28 4	23 8½	22 6½	23 0½	23 0½	22 9½
Canary Islands . .	12 10	9 1½	8 7	7 0	6 11½	Rice Ports . .	34 2	32 8½	26 4	23 5	25 7	—
Bordeaux . .	8 11	5 10	5 5½	4 8	4 4½	Bombay (d.w.) .	24 10	26 14	19 3½	20 3	20 9	—
Bilbao . .	12 10	7 11½	8 0½	6 10½	6 9½	Odessa, etc. (direct)	—	14 10	11 7½	10 8½	10 2½	10 2½
Stockholm . .	10 7	5 11½	—	5 5½	4 6½	Danube . .	25 10	19 10½	14 7	14 8½	14 2½	13 8
Rotterdam . .	8 7	4 3½	3 11½	3 5½	3 5½	Sulina (direct) .	—	15 10½	11 2½	11 1½	10 11½	10 11½
Hamburg . .	6 10½	4 5½	—	3 8½	3 7½	Bilbao . .	10 2	6 6½	4 3	—	—	—
Algiers . .	13 2	9 4½	8 5	7 5½	7 3½	Huelva . .	10 8	8 5½	8 8	7 9½	7 6½	8 3½

\* To Tyne.

## "LAID-UP" STEAM AND MOTOR TONNAGE OF PRINCIPAL MARITIME COUNTRIES.

	Jan. 1st, 1929.	Jan. 1st, 1930.	Jan. 1st, 1931.	Jan. 1st, 1932.	Jan. 1st, 1933.	July 1st, 1933.	Jan. 1st, 1934.	July 1st, 1934.
	Gross tons.							
Gt. Brit. & Ireland	528,000	564,000	2,649,000	3,146,000	3,095,000	3,204,000	2,045,000	1,719,000
Australia . . .	†	†	†	165,000	106,000	87,000	92,000	66,000
United States :—								
Shipping Board	2,144,000	1,588,000	1,443,000	1,941,000	1,519,000	1,451,000	1,362,000	1,523,000
Privately owned	818,000	666,000	1,216,000	1,843,000	2,069,000	1,792,000	1,457,000	1,381,000
U.S. total . . .	2,962,000	2,254,000	2,659,000	3,184,000	3,588,000	3,243,000	2,819,000	2,904,000
Belgium . . .	†	†	†	187,000	177,000	139,000	†	†
Denmark . . .	†	†	†	210,000	275,000	105,000	70,000	33,000
France . . .	133,000	90,000	219,000	751,000	1,006,000	975,000	887,000	717,000
Greece . . .	74,000	87,000	223,000	180,000	207,000	309,000	75,000	185,000
Holland . . .	9,000	4,000	324,000	595,000	782,000	560,000	418,000	303,000
Italy . . .	250,000	170,000	649,000	800,000	638,000	526,000	428,000	303,000
Japan . . .	46,000	44,000	323,000	359,000	256,000	159,000	155,000	49,000
Norway . . .	19,000	13,000	572,000	942,000	635,000	634,000	448,000	390,000
Spain . . .	31,000	25,000	102,000	139,000	250,000	392,000	348,000	341,000
Sweden . . .	2,000	2,000	106,000	186,000	211,000	138,000	182,000	129,000
Other Countries . . .	†	†	†	1,034,000	1,308,000	763,000	523,000	266,000
World's total . . .	4,054,000	3,253,000	7,857,000	11,878,000	12,534,000	11,234,000	8,490,000	7,405,000

† No data available.

## PAY IN THE MERCHANT SERVICE.—MONTHLY RATES.

## Foreign-going Cargo Steamers.\*

Rating.	1914.		1924.†		1932.‡	
	£	s.	£	s.	£	s.
First Mates . . .	12	5 to 14	5	17	10 to 26	10
Second Mates . . .	9	5 „	12 15	15	0 „	18 10
Third Mates . . .	7	10 „	10 10	13	0 „	14 0
Chief Engineers . . .	16	15 „	24 0	21	10 „	34 10
Second Engineers . . .	12	5 „	14 15	17	10 „	26 10
Third Engineers . . .	8	15 „	11 15	15	0 „	18 10
Carpenters . . .	7	0 „	7 10	12	10 „	16 10
Boatswains . . .	6	5 „	6 10	11	10 (Fixed rate.)	9 12 (Fixed rate.)
Firemen . . .	5	10 „	6 0	10	10 „	8 12
Able Seamen . . .	5	0 „	5 10	10	0 „	8 2

\* On Oil-Tank Vessels the rates are supplemented by the following percentage additions:—

Chief Engineers . . . . . 12½ per cent.

First Mates and Second Engineers . . . . . 10 „

Other Mates and Engineers . . . . . 7½ „

On Motor Vessels there is a special National Standard Scale of Pay for Engineer Officers substantially higher than on steam-driven vessels.

† The 1924 figures are the National Maritime Board standard rates of pay, effective from September 5, 1924, and based, in the case of Navigating and Engineer Officers, on tonnage and seniority.

‡ These rates, effective from January 31, 1932, represent in general a reduction of 10 per cent on those ruling in 1925-31.

On Passenger Liners, Navigating and Engineer Officers, as a rule, receive now, as before the War, wages from 10 to 20 per cent. higher than the Standard Cargo-Vessel rates.

## EXPORTS OF NEW SHIPS FROM THE UNITED KINGDOM.

## SHIPS NOT REGISTERED AS BRITISH, WITH THEIR MACHINERY.

Year.	War Vessels (including Machinery and Armament).	Steam and Motor Ships (other than War Vessels).		Sailing Ships (other than War Vessels) including Boats.	Total of New Ships.
		Hulls and Fittings.	Machinery.		
		£	£		
1905	50,000	3,693,422	1,516,183	171,693	5,431,298
1906	2,800,000	3,973,873	1,668,592	201,706	8,644,171
1907	554,700	6,586,449	2,550,702	326,262	10,018,113
1908	1,879,994	5,902,428	2,505,280	189,773	10,567,475
1909	247,000	3,698,556	1,819,618	161,940	5,927,114
1910	4,894,500	2,553,427	1,209,119	113,158	8,770,204
1911	25,000	3,745,349	1,632,402	259,564	5,663,115
1912	765,000	4,243,308	1,750,351	268,503	7,027,162
1913	2,617,100	5,867,179	2,336,509	205,742	11,026,530
1914	308,385	4,716,226	1,784,900	123,043	6,932,554
1915	—	1,170,606	472,597	49,548	1,692,661
1916	20,000	754,372	481,703	34,510	1,290,585
1917	—	706,084	347,354	33,869	1,087,307
1918	—	778,525	229,292	39,517	1,047,834
1919	—	1,703,961	505,652	118,718	2,328,331
1920	—	26,280,243		295,771	26,576,016
1921	—	29,523,833		470,615	29,994,448
1922	—	30,222,080		220,435	30,442,515
1923	—	9,566,187		148,474	9,714,661
1924	—	5,257,957		264,388	5,522,345
1925	14,354	5,996,585		265,384	6,276,823
1926	19,300	4,314,414		296,265	4,629,979
1927	45,388	4,233,509		251,758	4,530,655
1928	5,143,150	10,489,794		315,630	15,575,749
1929	3,820,250	11,457,076		203,840	15,511,116
1930	707,400	19,091,308		343,708	20,142,416
1931	600,000	9,708,873		148,872	10,457,745
1932	525,000	3,268,253		120,322	3,913,575
1933	254,928	1,843,751		48,168	2,146,847

## HIGHEST AND LOWEST IRON AND STEEL PRICES, 1914-1934.

	1914.	1920.	1924.	1929.	1931.	1933.	1934. 1st 11 mths.
Marked Iron Bars,	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
S. Staffs . . . {	9 0 0	33 10 0	15 0 0	12 10 0	12 10 0	12 0 0	12 0 0
Common Iron Bars,	8 10 0	26 15 0	14 10 0	12 0 0	12 0 0	12 0 0	12 0 0
Cleveland . . . {	8 2 6	30 0 0	12 10 0	10 15 0	10 15 0	9 15 0	9 15 0
Steel Ship Plates, $\frac{3}{4}$ -in.,	7 10 0	24 5 0	12 0 0	10 5 0	10 0 0	9 12 6	9 12 6
Middlesbrough . . . {	7 0 0	20 0 0	9 10 0	8 7 6*	8 15 0*	8 15 0*	8 15 0*
Steel Ship Plates,	7 5 0	28 5 0	12 10 0	8 15 0*	8 15 0*	8 15 0*	8 15 0*
Glasgow . . . {	6 17 6	21 10 0	9 15 0	8 7 6*	8 15 0*	8 10 0*	8 10 0*
Steel Boiler Plates,	8 5 0	31 0 0	14 0 0	10 10 0*	10 5 0*	9 0 0*	9 10 0*
Middlesbrough . . . {	8 0 0	23 0 0	13 0 0	9 12 6*	8 15 0*	8 0 0*	8 0 0*
Steel Boiler Plates,	7 5 0	31 10 0	14 0 0	10 10 0*	10 10 0*	9 0 0*	9 5 0*
Glasgow . . . {	7 0 0	24 0 0	13 0 0	10 0 0*	8 15 0*	8 10 0*	8 10 0*

\* Subject to rebate.

OCEAN DISTANCES FROM THE BRITISH ISLES.  
(Steaming Distances in Nautical Miles.)

## I.—CONTINENT.

	Archangel.	Christiania.	Copenhagen.	Stockholm.	Dandie.	Hamburg.	Amsterdam.	Rotterdam.	Antwerp.	Harve.	Bordeaux.	Bilbao.	Lisbon.	Gibraltar.
Cardiff .	2,250†	1,060* 1,126*	1,498*	1,400*	839	577	553	541	367	531	561	878	1,145	
Glasgow .	2,036†	930† 996†	1,408† 1,280†	940	818	794	782	610	778	808	1,093	1,400		
Liverpool .	2,104†	1,005† 1,066†	1,478† 1,340†	942	711	687	675	503	671	701	1,010	1,290		
London .	2,106	702 700	1,180	989	427	188	177	180	198	682	712	1,058	1,325	
Sunderland	1,755	520 586	998	860	413	258	206	327	397	806	915	1,225	1,615	

\* South about.

† North about.

## II.—MEDITERRANEAN, BLACK SEA AND RED SEA.

	Marseilles.	Naples.	Hastins.	Malta.	Genoa.	Trieste.	Athens.	Constantinople.	Odessa.	Rome.	Smyrna.	Alexandria.	Port Said.	Aden.
Cardiff .	1,870	2,080	2,170	2,135	2,030	2,804	2,630	2,910	3,230	3,400	2,765	2,922	3,075	4,515
Glasgow .	2,085	2,295	2,475	2,350	2,254	3,019	2,864	3,125	3,445	3,705	2,980	3,137	3,300	4,730
Liverpool .	1,975	2,265	2,367	2,240	2,144	2,909	2,750	3,190	3,335	3,410	2,870	3,083	3,290	4,620
London .	2,050	2,260	2,354	2,315	2,219	2,984	2,810	3,190	3,410	3,670	2,045	3,122	3,248	4,695
Sunderland	2,222	2,540	2,520	2,511	2,381	3,164	2,990	3,370	3,690	3,950	3,225	3,382	3,445	4,975

## III.—AFRICA AND EASTERN ATLANTIC, ETC.

	Azores.	St. Vincent (C.V.I.)	Las Palmas.	Bathurst.*	Freetown.	Lagos.	Ascension.	Loanda.†	St. Helena.	Cape Town.	Durban.	Mauritius.‡	Melbourne.‡ (Australia).	Hobart.‡ (Tasmania).
Cardiff .	1,330	2,345	1,523	2,484	2,838	3,968	3,775	4,841	4,472	5,047	6,721	8,273	11,761	11,785
Glasgow .	1,495	2,500	1,745	2,706	3,059	4,189	3,940	5,056	4,637	6,168	6,942	8,494	11,982	12,006
Liverpool .	1,385	2,450	1,655	2,616	2,962	4,097	3,830	4,946	4,527	6,076	6,850	8,402	11,890	11,914
London .	1,460	2,525	1,699	2,660	3,008	4,138	3,900	5,021	4,597	6,117	6,891	8,443	11,931	11,955
Sunderland	1,740	2,805	1,890	2,851	3,199	4,329	4,185	5,301	4,882	6,308	7,082	8,334	12,122	12,146

\* Via Teneriffe and Dakar.

† Via St. Vincent (C.V.I.).

‡ Via Cape Town.

## IV.—INDIAN OCEAN, ETC. (via SUEZ).

	Karachi.	Bombay.	Colombo.	Zanzibar.	Mauritius.	Madras.	Calcutta.	Rangoon.	Singapore.	Batavia.	Fremantle (W. Australia).	Adelaide.	Melbourne.	Hobart.
Cardiff .	5,930	6,150	6,615	6,195	6,825	7,016	7,610	7,845	8,165	8,450	9,745	10,712	11,070	11,100
Glasgow .	6,145	6,365	6,830	6,433	7,040	7,120	7,854	8,060	8,380	8,635	9,960	10,953	11,285	11,315
Liverpool .	6,135	6,255	6,720	6,220	6,930	7,065	7,750	7,955	8,270	8,555	9,850	10,847	11,175	11,330
London .	6,110	6,330	6,535	6,295	7,005	7,040	7,795	7,935	8,345	8,630	9,665	10,890	11,250	11,380
Sunderland	6,300	6,010	6,075	6,575	7,285	7,250	7,986	8,135	8,625	8,815	10,105	11,090	11,420	11,560

## V.—CHINA, JAPAN, ETC. (via SUEZ).

	Saigon.	Hong Kong.	Shanghai.	Nagasaki.	Yokohama.	Vladivostock.	Fiji Islands.	Manilla.	Brisbane (via Torres Strait).	Sydney (N.S.W.)	Auckland (N.Z.)	Wellington (N.Z.)	Honolulu.	San Francisco.
Cardiff .	8,805	9,718	10,470	10,595	11,065	11,250	11,540	9,470	11,788	11,520	12,400	12,420	13,150	13,490
Glasgow .	9,020	9,815	10,712	10,819	11,280	11,414	11,755	9,814	12,028	11,764	12,655	12,660	13,365	13,705
Liverpool .	8,910	9,856	10,665	10,700	11,170	11,355	11,645	9,575	11,924	11,600	12,545	12,560	13,953	13,795
London .	8,985	9,900	10,650	10,775	11,245	11,430	11,720	9,750	11,961	11,708	12,625	12,612	14,010	13,800
Sunderland	9,265	10,060	10,820	11,055	11,525	11,710	12,000	9,930	12,152	11,900	12,790	12,850	14,220	13,960

\* Via Nagasaki.

## VI.—AMERICA.

	Quebec.	Halifax, N.S.	New York.	Boston.	Jamaica.	New Orleans.	Panama.	Colon.	Pernambuco.	Bahia.	Rio de Janeiro.	Montevideo.	Buenos Aires.	Valparaiso.
Cardiff .	2,750	2,505	3,065	2,782	4,030	4,510	4,527	4,487	3,950	4,375	5,020	5,900	6,100	8,690
Glasgow .	2,618	2,390	3,280	3,065	4,245	4,725	4,665	4,625	4,165	4,540	5,235	6,205	6,315	8,905
Liverpool .	2,655	2,455	3,052	2,805	4,135	4,615	4,570	5,530	4,055	4,490	5,125	6,095	6,205	8,795
London .	3,072	2,685	3,243	3,030	4,210	4,790	4,782	4,742	4,130	4,505	5,200	6,370	6,280	8,870
Sunderland	3,240	2,665	3,450	2,803	4,490	4,970	4,975	4,935	4,410	4,785	5,480	6,450	6,560	9,250

# AIR REFERENCE SECTION.



## BRITISH NAVAL AIRCRAFT TYPES.

## FLEET AIR ARM.

Maker, Number, Name.	Type, Number of Seats.	Engine H.P., Make.	Max. speed, m.p.h.	Ceiling, in feet.
Hawker Nimrod.	Single-seater Fighter. Float or Ship Plane.	480 Rolls-Royce "Kestrel."	192.5	26,900
Hawker Osprey.	Two-seater Fighter. Reconnaissance.	525 Rolls-Royce "Kestrel."	174.5	22,850
Fairey Seal.	Fleet Spotter Recon- naissance. 2-3 seater.	525 Armstrong-Siddeley "Panther."	140	17,000
Fairey Seal.	Fleet Spotter Recon- naissance. 2-3 seater. Seaplane.	525 Armstrong-Siddeley "Panther."	128.7	13,900
Fairey III F.	Fleet Spotter Recon- naissance. 2-3 seater. Seaplane.	539 Napier "Lion."	130	12,700
Blackburn Baffin.	Fleet Torpedo Carrier. Two-seater.	587 Bristol "Pegasus."	131.5	15,000
Blackburn Shark.	Torpedo Spotter Re- connaissance. Three- seater.	720 Armstrong-Siddeley "Tiger."	(Details not available.)	
Supermarine Seagull V.	Fleet Spotter Recon- naissance. Three- seater.	587 Bristol "Pegasus"	(Details not available.)	

**R.A.F. SHORE-BASED AIRCRAFT WHICH MAY BE EMPLOYED IN  
CO-OPERATION WITH NAVAL FORCES.\***

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. speed, m.p.h.	Ceiling, in feet.
Vickers Vilde-beest.	Torpedo Carrier and Bomber. Two-seater.	587 Bristol "Pegasus."	141	16,250
Supermarine Southampton II.†	Reconnaissance Flying Boat. Five-seater.	Two 488 Napier "Lion."	95	5,950
Supermarine Scapa.	Reconnaissance Flying Boat. Five-seater.	Two 525 Rolls-Royce "Kestrel."	143	14,950
Blackburn Iris V.	Reconnaissance Flying Boat. Five-seater.	Three 825 Rolls-Royce "Buzzard."	129	12,300
Short Singapore III.	Reconnaissance Flying Boat. Five-seater.	Four 525 Rolls-Royce "Kestrel."	136	13,600
Blackburn Perth.	Reconnaissance Flying Boat. Five-seater.	Three 825 Rolls-Royce "Buzzard."	122	10,000
Short Rangoon.	Reconnaissance Flying Boat. Six-seater.	Three 508 Bristol "Jupiter."	112.3	10,300
Short R6/28.	Reconnaissance Flying Boat. Ten-seater.	Six 825 Rolls-Royce "Buzzard."	(Experimental. Data not available.)	

\* R.A.F. bombers of the Home Defence Air Force are also occasionally employed in Combined Exercises.

† Now obsolescent and being gradually replaced.

**AIRCRAFT ENDURANCE.**

Hawker Nimrod,  $3\frac{1}{2}$  hours at 114 m.p.h. ; Hawker Osprey,  $4\frac{1}{2}$  hours at 107 m.p.h. ; Fairey Seal,  $4\frac{1}{2}$  hours at 103 m.p.h. ; Fairey IIIF,  $5\frac{1}{2}$  hours at 98 m.p.h. ; Blackburn Baffin,  $3\frac{1}{2}$  hours at 95 m.p.h.

Supermarine Southampton II, 8.4 hours at 80 m.p.h. ; Short Rangoon, 7 hours at 93 m.p.h.

**DISTRIBUTION OF F.A.A. AIRCRAFT IN THE FLEET AT THE BEGINNING OF 1935.**

Aircraft Carrier.	Fighter.	Torpedo-Bomber.	Torpedo-Spotter-Reconnaissance.	Spotter-Reconnaissance.	Total.
Courageous (Home).	3 Osprey. 9 Nimrod.	12 Baffin.	12 Blackburn Shark.	12 Seal.	48
Furious (Home).	3 Osprey. 6 Nimrod.	12 Baffin.	—	12 IIIF.	33
* Eagle (Med.).	—	12 Baffin.	—	12 IIIF.	24
Hermes (China).	6 Osprey.	—	—	9 Seal.	15
† Glorious (undergoing large repairs).	3 Osprey. 9 Nimrod.	—	—	6 Seal.	18
					138

\* These aircraft are ex-Glorious, and await her recommissioning after refit.

† These aircraft are disembarked in U.K.

**SHIPS FITTED WITH CATAPOULTS AND THE STATION TO WHICH THEY BELONG.**

*Home Fleet.*

Barham, Valiant, Renown.	1 IIIF each.
Nelson (with no catapult).	1 Seagull V.
Leander, Orion, Neptune.	1 Osprey each.
Achilles.	2 Osprey.

*Mediterranean Fleet.*

Royal Sovereign, Ramillies, London, Sussex, Devonshire, Shropshire.	1 Osprey each.
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*China Fleet.*

Kent, Cornwall, Berwick, Cumberland, Suffolk.	1 Osprey each.
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*West Indies and South Africa.*

Norfolk, York, Dorsetshire. Exeter.	1 IIIF each. 2 IIIF.
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*East Indies.*

Emerald, Enterprise.	1 Osprey each.
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27

27

165

It will be seen that there are 13 Squadrons in the Aircraft Carriers. The Catapult aircraft are organised into 6 Flights.

## FOREIGN NAVAL AIRCRAFT TYPES.

## United States Naval Air Service.

## AIRCRAFT, HEAVIER-THAN-AIR.

Maker, Number, Name,	Type, Number of Seats,	Engine H.P. Make,	Max. speed, m.p.h.	Ceiling, in feet.
Martin. PM-1.	Patrol Flying Boat. Crew of 5.	Two 525 " Cyclone."	120	12,000
Boeing. F4B-4.	Single-seater Fighter.	500 " Wasp."	187	27,500
Curtiss. F11C-3.	Single-seater Fighter.	700 " Cyclone."	202	—
Grumman. FF-1.	Two-seater Fighter.	700 " Cyclone."	—	—
Curtiss. N2C-2. " Fledgling."	Two-seater Training.	240 " Whirlwind."	113	17,000
Douglas. PD-1.	Coastal Patrol Flying Boat. Crew of 4.	Two 525 " Cyclone."	121	11,800
Douglas. P2D-1.	Torpedo Bomber and G.P. Seaplane. Three-seater.	Two 575 " Cyclone."	135	—
Loening. OL-9.	Amphibian. Two-seater.	425 " Wasp."	124 Range 650 miles.	
Consolidated. P2Y-1.	Patrol Flying Boat. Crew of 5.	Two 600 " Cyclone."	130	—
Martin. BM-2. Diving Bomber.	High performance Bomber. Two-seater.	525 " Hornet."	140	18,000
Vought. 03U-4. " Corsair."	Two-seater land, sea, or Amphib. Observation.	500 " Wasp."	—	—

All engines are air-cooled. "Wasp" and "Hornet" engines are made by Pratt and Whitney. "Whirlwind" and "Cyclone" engines are made by Wright.

## AIRCRAFT, LIGHTER-THAN-AIR.

The "Los Angeles" (LZ-126) was built by Zeppelin Co., of Friedrichshafen, and flown across the Atlantic (October, 1924) by

**United States—continued.**

a German crew for delivery to the United States. This airship has now been decommissioned. The ZMC-2 was manufactured by the Aircraft Development Corporation, and delivered to the U.S. Navy in September, 1929. She is used at Lakehurst for training.

The "Macon" (ZRS-5), built by the Goodyear Zeppelin Corporation, was delivered to the U.S. Navy in the summer of 1933. She has accommodation for five scouting aircraft, and is provided with trapeze gear enabling the aircraft to return to the airship. The "Akron" (ZRS-4), similar to the "Macon," was lost at sea in April, 1933.

The United States have the following shore naval bases:—Pensacola, Florida (Training); San Diego, California (Fleet Base); Hampton Roads, Virginia (Fleet Base); Lakehurst, New Jersey (Lighter-than-air craft); Pearl Harbour, Hawaii (Fleet Base); Coco-Solo, Canal Zone (Fleet Base); Anacostia, Columbia (Experimental); Seattle, Washington (Reserve Training Base); Sunnyvale, California (Lighter-than-air craft).

**Japanese Naval Air Service.**

The following particulars of types of aircraft in use were supplied by a Japanese correspondent to *Ariation* (New York) and published in its issue for July, 1933:—

Type.	Crew.	Engine and H.P.	Weight, lbs.	Speed, m.p.h.
<i>Fighter.</i>				
Navy 3 (Gloster Gambet).	1	Jupiter, 450	3,058	156
Nakajima 90. . . . .	1	Jupiter, 450	2,860	193
<i>Reconnaissance.</i>				
Navy 14-II. . . . .	3	Lorraine, 450	6,050	111
Navy 15. . . . .	2	Hispano, 300	4,290	114
Kawanishi 90. . . . .	3	Jupiter, 450	5,500	—
Navy 90-II. . . . .	2	Jupiter, 450	—	—
<i>Bomber.</i>				
Navy 13 . . . . .	3	Napier, 450	6,270	125
Navy 89 . . . . .	3	Hispano, 600	—	—
<i>Flying Boat.</i>				
Navy 15 . . . . .	4	2 Lorraine, 450	12,815	89
Navy 90-I. . . . .	6	3 Hispano, 700	26,400	137
Short 90-II. . . . .	6	3 Rolls-Royce, 800	28,600	137

The Hawker "Nimrod" single-seater fighter has been tested and the construction licence purchased from England.

Lighter-than-air craft are based on Kasunigaura. There is one airship built in Japan in 1929 which is reported to be of 7,000 cubic metres capacity and 250 feet long. They also have two "Blimps."

### French Naval Air Service.

Lighter-than-air craft activities received a severe set-back when the "Dixmude" (ex-German L27) was lost with all hands off the coast of Sicily on December 20, 1923. The French Navy is now developing two classes of airship, the "Vedettes" and the "Escorteurs." The "Vedettes," of which there are nine, are of about 125,000 cubic feet capacity, speed of about 40 m.p.h., a crew of four, and endurance varying from 15 to 25 hours. The "Escorteurs," of which there are four, are of about 350,000 cubic feet, have a speed of about 40 m.p.h., a crew of six, and an endurance of about 40 hours.

The bases and aerodromes of the Naval Air Service are as follows :

1st Region (Cherbourg).—Chanteyne (Escad. 1TB, Seaplanes); (Escad. 1E1, Flying Boats).

2nd Region (Brest).—Lanion (Escad. 2S1, Flying Boats); Brest (Captive Balloons); Rochefort (Training); Houurtin (Training).

3rd Region (Toulon).—St. Raphael (Experimental); Berre (Escads. 3B1, 3B2, 4T1 (being formed), Seaplanes, 3E1 and 3E2, Flying Boats); Hyeres (Landplanes), 3C1; 3S1 (Flying Boats); Marignano, 3C2, 3C3 (Landplanes).

4th Region (Bizerta).—Karouba (Escads. 4B1, 4B2, 4B3, Seaplanes; 4E1, 4S1, Flying Boats); Bizerta (Captive Balloons).

Maker, Number, Name.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling, in feet.
C.A.M.S. 37A.	Three-seater Recon. Flying Boat.	450 Geared "Lorraine" W. Pusher Airscrew.	108	14,760 (service).
C.A.M.S. 35	Bomber or Recon. Flying Boat.	Two 480 "Gnome Rhone Jupiter."	130	14,700 (service).
Farman "Goliath" F168	Torpedo Bomber Seaplane.	Two 480 "Gnome Rhone Jupiter."	112	13,000 (absolute).
Levasseur P.L. 7.	Three-seater Torpedo Bomber.	600 "Hispano."	100	13,200 (service).
Levasseur P.L. 10.	Three-seater Reconnaissance.	600 "Hispano Suiza."	124	—
Nieuport Delage 62C1	Single-seater Fighter.	500 "Hispano Suiza."	167	22,500 (service).

### Italian Naval Air Service.

Lighter-than-air craft do not exist in Italy, and all experiments and research were abandoned after the disaster to General Nobile in the Italia in 1928, while making an attempt to fly over the North Pole.

Maker, Name, Number.	Type, Number of Seats.	Engine H.P. Make.	Max. Speed, m.p.h.	Ceiling. Endurance in hours.
Piaggio P6ter. Floatplane.	Two-seater Reconnaissance.	410 " Fiat " A20.	121	11,650 5
Macchi. M41bis. Flying Boat.	Single-seater Fighter.	410 " Fiat " A20.	159	20,100 3' 5"
Fiat. CR20. Floatplane.	Single-seater Fighter. All metal.	410 " Fiat " A20.	159	18,470 3
Savoia. S62bis. Flying Boat.	Three-seater Reconnaissance.	750 " Isotta Fraschini " (Asso.).	140	14,760 5 normal
Savoia. S59bis. Flying Boat.	Two-seater Reconnaissance.	500 " Isotta Fraschini " (Asso.).	130	14,000 4
Savoia. S55. Monoplane. Flying Boat.	Five-seater Twin Hull Reconnaissance or Bomber.	Two 500 " Isotta Fraschini."	118	9,200 4
Macchi. M18. Flying Boat.	Two-seater Reconnaissance.	200-250 " Isotta Fraschini " Semi (Asso.).	107	12,500 4
Cant 5. Flying Boat.	Single-seater Fighter.	410 " Fiat " A20.	150	18,000 4
M.F.4. Flying Boat.	Three-seater Reconnaissance Monoplane.	500 Bristol Jupiter.	121	14,500 6

Italy does not at present use any supercharged engines in her Naval Aircraft. The wearing of parachutes of the "Salvator" type is compulsory for all occupants of Service Aircraft. Nearly all aircraft carry W/T transmitting and receiving sets, and a few are fitted with R/T. Italy's ship-borne aircraft are chiefly flying boats and are of various types, including the Cant 25, the M.F.4, and the Macchi M.18.



**PROFILES OF  
BRITISH AND FOREIGN WARSHIPS.**



## CAPITAL SHIPS.

[In order to facilitate identification, the ships are arranged in accordance with the number of funnels and masts, as these are the features most easily distinguished at a distance. Dimensions and particulars of British and foreign warships will be found on pp. 213-253. All the profiles are drawn to the scale  $\frac{1}{4}$  in. = 100 ft.]

[Indexes to the names of vessels of which profiles are included in this section are given at the end of the volume.]



FRANCE. Battleships. Condorcet, Diderot, Voltaire.  
(Diderot has a tall mainmast.)



SWEDEN. Battleship. Oscar II.



GREAT BRITAIN. Battle-cruiser. Hood.



GREAT BRITAIN. Battle-cruisers. Renown, Repulse.



JAPAN. Battleships. Mutsu, Nagato.



JAPAN. Battleships. Ise, Hyuga.



JAPAN. Battleships. Fuso and Yamashiro.  
(After reconstruction, 1934.)



JAPAN. Battleships. Haruna, Kirishima, Kongo.



CHILE. Battleship. Almirante Latorre.  
(Modernised 1931—mainmast raised and bridge work altered.)



UNITED STATES. Battleships. California, Colorado, Maryland, Tennessee,  
West Virginia.



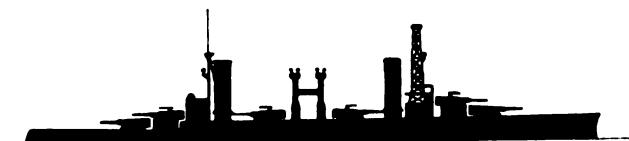
ITALY. Battleships. *Andrea Doria*, *Caio Duilio*.



ITALY. Battleships. *Conte di Cavour*, *Giulio Cesare*.



UNITED STATES. Battleship. *Arkansas*.



ARGENTINE. Battleships. *Moreno*, *Rivadavia*.



FRANCE. Battleships. *Bretagne*, *Lorraine*, *Provence*.  
(Now have tall maintopmasts and no foretopmasts.)



FRANCE. Battleships. *Courbet*, *Jean Bart*, *Paris*.



BRAZIL. Battleships. Minas Geraes, São Paulo.



GREAT BRITAIN. Battleships. Nelson, Rodney.



FRANCE. Battleship. Dunkerque.



GREAT BRITAIN. Battleships. Queen Elizabeth, Warspite, Barham, Valiant, Malaya.



UNITED STATES. Battleships. New York, Texas.



GREAT BRITAIN. Battleships. Ramillies, Resolution, Revenge, Royal Oak, Royal Sovereign.



UNITED STATES. Battleships. Idaho, Mississippi, New Mexico.  
(Before modernisation. Now being modernised on same general lines as Arizona and Pennsylvania.)



UNITED STATES. Battleships. Arizona, Pennsylvania.



UNITED STATES. Battleships. Nevada, Oklahoma.



SPAIN. Battleship. Jaime I.



GERMANY. Armoured Ships. Deutschland, Admiral Scheer, Admiral Graf Spee.



SOVIET UNION. Battleships. Marat and Paris Commune.

AIRCRAFT AND SEAPLANE CARRIERS AND  
TENDERS.



GREAT BRITAIN. Aircraft Carrier. Eagle.



SWEDEN. Aircraft Cruiser. Gotland.



GREAT BRITAIN. Aircraft Carrier. Hermes.



FRANCE. Aircraft Carrier. Béarn.



FRANCE. Aviation Transport. Commandant Teste.



ROYAL AUSTRALIAN NAVY. Seaplane Carrier. Albatross.



UNITED STATES. Aircraft Carriers. Saratoga, Lexington.



GREAT BRITAIN. Aircraft Carriers. Courageous, Glorious.



JAPAN. Aircraft Carrier. Hoshio.



GREAT BRITAIN. Aircraft Carrier. Furious.



JAPAN. Aircraft Carrier. Akagi.

( P10 )

AIRCRAFT CARRIERS.



JAPAN. Aircraft Carrier. Kaga.



UNITED STATES. Aircraft Carrier Ranger.  
(NOTE.—Funnels hinge outboard.)



GREAT BRITAIN. Aircraft Carrier. Argus.



JAPAN. Aircraft Carrier. Ryujo.



UNITED STATES. Aircraft Carrier. Langley

## CRUISERS AND COAST DEFENCE SHIPS.



JAPAN. Cruisers. ("Sendai" class.) Naka, Sendai, Jintsu.



UNITED STATES. Scout Cruisers. ("Omaha" class.) Cincinnati, Concord, Detroit, Marblehead, Memphis, Milwaukee, Omaha, Raleigh, Richmond, Trenton.

(There are small differences in the arrangement of guns aft.)



JAPAN. Cruisers. ("Chikuma" class.) Hirado, Yahagi.



ROYAL AUSTRALIAN NAVY. Cruiser. Adelaide.



ITALY. Armoured Cruisers. (Classified as Battleships, 2nd class, in Italian official lists.) San Giorgio, San Marco.



ITALY. Light Cruiser. Taranto (*ex-German Strassburg*).



**GREAT BRITAIN.** Cruisers. ("London" class.) Devonshire, London, Shropshire, Sussex. ("Norfolk" class.) Dorsetshire, Norfolk.



**GREAT BRITAIN.** Cruisers. ("Kent" class.) Berwick, Cornwall, Cumberland, Kent, Suffolk.

**COMMONWEALTH OF AUSTRALIA.** Cruisers. ("Kent" class.) Australia, Canberra.



**GREAT BRITAIN.** Cruisers. ("E" class.) Emerald, Enterprise.

(In Enterprise the forward 6-in. guns are in a twin mounting on the forecastle deck.)



**JAPAN.** Light Cruisers. ("Kuma" class.) Kiso, Kitakami, Kuma, Oi, Tama. ("Natori" class.) Isuzu, \*Natori, \*Nagara, \*Yura, \*Kinu, \*Abukuma.

\* Has aircraft hangar incorporated in bridge structure.



**JAPAN.** Light Cruisers. ("Tenryu" class.) Tatsuta, Tenryu.



**SPAIN.** Light Cruiser. Mendez Nuñez.



SPAIN. Light Cruiser. Republique.



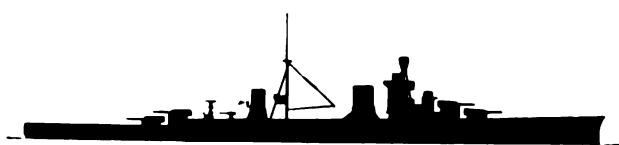
ITALY. Scout Cruiser. Quarto.



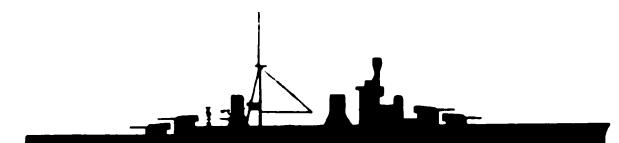
JAPAN. Cruisers. ("Nachi" class.) Nachi, Myoko, Ashigara, Haguro.



JAPAN. Cruisers. ("Takao" class.) Takao, Atago, Chokai, Maya.



ITALY. Cruiser. (Modified "Trento" class.) Bolzano.



ITALY. Cruisers. ("Zara" class.) Pola, Zara, Fiume, Gorizia.



JAPAN. Cruisers. ("Furutaka" class.) **Furutaka, Kato.**  
(The tops of the funnels are square to the funnels.)



JAPAN. Cruisers. ("Furutaka" class.) **Aoba, Kinugasa.**  
(The tops of the funnels are square to the funnels.)



GREAT BRITAIN. Cruisers. (Improved "Birmingham" class.) **Effingham, Frobisher, Hawkins, Vindictive.**  
(In **Vindictive** the raised 7.5-in. gun forward is removed and a hangar fitted forward of the bridge.)



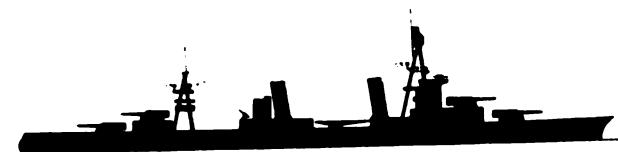
FRANCE. Cruisers. ("Duquesne" class.) **Duquesne, Tourville.** ("Suffren" class.)  
**Suffren, Colbert, Foch, Duplex.**  
(Colbert, Duplex and Foch have tripod mainmasts and the catapults between the funnels.)



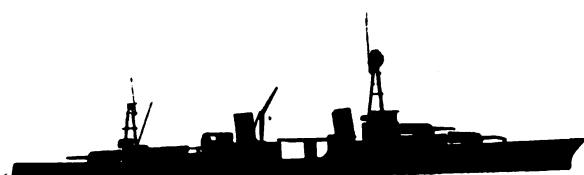
UNITED STATES. Cruisers. ("Astoria" class.) **Astoria, New Orleans, Minneapolis, San Francisco, Tuscaloosa.**



UNITED STATES. Cruisers. **Portland and Indianapolis.**



UNITED STATES. Cruisers. ("Pensacola" class.) Salt Lake City, Pensacola.



UNITED STATES. Cruisers. ("Chester" class.) Northampton, Chester, Louisville.  
("Augusta" class.) Chicago, Houston, Augusta.



FRANCE. Training Cruiser. Jeanne d'Arc.  
(The catapults are removed).



GREAT BRITAIN. Cruisers. York and Exeter. ("York" class.)  
(In Exeter the funnels and masts are vertical.)



GERMANY. Light Cruisers. KÖln, Karlsruhe, Konigsberg.



FRANCE. Cruiser Minelayer. Emile Bertin.



ITALY. Cruisers. ("Condottieri" class.) Alberico de Barbiano, Alberto di Giussano, Bartolomeo Colleoni, Giovanni della Bande Nere.



ITALY. Cruisers. ("Condottieri" class.) Armando Diaz, Luigi Cadorna.



GREAT BRITAIN. Cruiser Minelayer. Adventure. (Stern has been extended.)



NETHERLANDS. Cruisers. Java, Sumatra.



ITALY. Cruisers. ("Trento" class.) Trento, Trieste.



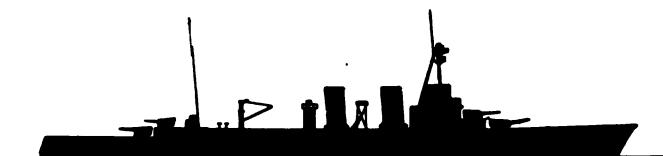
SPAIN. Cruisers. Libertad, Almirante Cervera, Miguel de Cervantes.  
(The mainmasts are tripods.)



GERMANY. Light Cruiser. Emden.



FRANCE. Cruiser Minelayer. Pluton.



FRANCE. Cruisers. ("Duguay-Trouin" class.) La Motte Picquet, Duguay-Trouin, Primauguet.



GREAT BRITAIN. Cruisers. ("D" class.) Danae, Dauntless, Dragon.



GREAT BRITAIN. Cruisers. ("D" class: repeat vessels.) Delhi, Dunedin, Diomede, Despatch, Durban.



GREAT BRITAIN. Cruisers. ("Ceres" class.) Cardiff, Ceres, Coventry, Curacao, Curlew.



GREAT BRITAIN. Cruisers. ("Carlisle" class.) Cairo, Calcutta, Capetown, Carlisle, Colombo.



GREAT BRITAIN. Cruisers. ("Caledon" class.) Caledon, Calypso, Caradoc.



GREAT BRITAIN. Cruisers ("Cambrian" class.) Castor, Constance.



SOVIET UNION. Cruiser. Krasni Kavkaz.



GREECE. Cruiser. Helle.



SWEDEN. Coast Defence Ships. Gustav V, Sverige.  
(Drottning Victoria at present has two funnels and a tripod mainmast,  
but is to be reconstructed and modernised as above.)



FRANCE. Cruiser. Algérie.



GERMANY. Light Cruiser. Leipzig.



GREAT BRITAIN. Cruisers. ("Leander" class.) Leander, Achilles, Neptune, Orion.



NETHERLANDS. Cruiser. Celebes.



ARGENTINE. Cruisers. Almirante Brown, Vinticinco de Mayo.



JAPAN. Light Cruiser. Yubari.



FINLAND. Armoured Gunboats. Vainämöinen, Ilmarinen.



NORWAY. Minelaying and Training Ship. Clav Trygvason.

## FLOTILLA LEADERS AND DESTROYERS

(See pp. 261-287.)



FRANCE. Flotilla Leaders. Bison, Guépard, Lion, Vauban, Vainqueur, Verdun, Aigle, Vautour, Albatros, Gerfaut, Vauquelin, Kersaint, Cassard, Tartu, Maille Brûlé, Le Chevalier-Paul.



FRANCE. Destroyers. Forbin, Frondeur, Fougueux, Foudroyant, Basque, Bordetais, Boutonnais, Bretois, L'Ardoise, L'Aixeyon, Le Fortune, Le Mars, La Palme, La Railleuse, Bourrasque, Orage, Ouragan, Simoun, Cyclone, Mistral, Sirocco, Tempête, Tramontane, Typhon, Trombe, Tornade.



FRANCE. Flotilla Leaders. Jaguar, Panthère, Léopard, Lynx, Chacal, Tigre.



UNITED STATES. Destroyers. Aylwin, Balch, Benham, Duncan, Parker, Cassin, Cummings and Downes. Sampson, Rowan, Davis, Allen, Wilkes, Shaw, Tucker, Conyngham, Porter, Wadsworth, Walnwright, O'Brian, Nicholson, Winslow, McDougal, Cushing and Ericsson, are generally similar.



UNITED STATES. Destroyers. The "Flush Deck" type; all U.S. destroyers except those in the preceding silhouette and those with three funnels.



POLAND. Destroyers. Burza, Wicher, are similar.



FRANCE. Destroyers. Algérien, Annamite, Arabe, Bambara, Hova, Kabylie, Marocain, Sakalave, Sénégalais, Somail, Tonkinois, Touareg.



ITALY. Destroyers. Gen. A. Cantore, Gen. A. Chinotto, Gen. A. Papa, Gen. A. Cascino, Gen. M. Prestinari, Gen. C. Montanari, A. Bassini, E. Cosenz, F. Stocco, G. Carini, G. Medici, G. Acerbi, G. la Farina, G. la Masa, G. Sirtori, N. Fabrizi, V. Orsi.



YUGO SLAVIA. Flotilla Leader. Dubrovnik.



JAPAN. 1st Class Destroyers. "Fubuki" class. (24 ships.)



FRANCE. Destroyers. Téméraire, Opiniâtre.



FRANCE. Destroyers. Enseigne Roux, Mécanicien Principal Lestin.



FRANCE. Destroyer. Enseigne Gaboïde.

FRANCE. Flotilla Leader. Amiral Séjourné.



ITALY. Flotilla Leaders (Scouts). Nicolooso Da Recco and class. (12 ships.)



ITALY. Flotilla Leaders (Scouts). Leone, Pan-tora, Tigre.



JAPAN. 1st Class Destroyers. "Mutsuki" class (12 ships), and "Kamikaze" class (9 ships).



JAPAN. 1st class Destroyers. "Minekaze" class (15 ships).



GERMANY. Destroyers. Iltis, Wolf, Tiger, Lucha, Jaguar, Leopard, Seeadler, Greif, Albatros, Kondor, Falke, Möwe.



GREAT BRITAIN. Flotilla Leader. Codring-ton.



GREAT BRITAIN. Destroyers. "Acasta," "Beagle," "Crusader" and "Defender" classes.

Flotilla Leaders. Keith, Duncan and Kempen-felt.



PORTUGAL. Destroyers. Vouga, Lima, Dao.

COLOMBIA. Destroyers. Antioquia, Caldas.



ARGENTINE. Flotilla Leaders. Mendoza, La Rioja, Tucuman.



ITALY. Flotilla Leaders (Scouts). Carlo Mirabello, Augusto Riboty.



GREAT BRITAIN. Flotilla Leaders. Broke, Keppel, Shakespeare, Spenser, Wallace, Bruce, Douglas, Campbell, Mackay, Malcolm, Montrose, Stuart. [In Stuart the torpedo tubes are removed.]

SPAIN. Flotilla Leaders. Almirante Valdes, etc., generally similar.



HOLLAND. Destroyers. De Ruyter, Evertsen, Piet Hein, Kortenaer, Banckert, Van Nes, Van Galen, Witte de With.



GREAT BRITAIN. Destroyers. Vanessa, Vanity, Vanoc, Vanquisher, Vectis, Vega, Velox, Vendetta, Venetia, Venturous, Verdun, Versatile, Vesper, Vidette, Vimiera, Violent, Vivacious, Vivian, Vimy (late Vancouver), Vorticern, Valhalla, Valentine, Valkyrie, Valorous, Vampire, Viceroy, Viscount, Voyager, Wakeful, Walker, Walpole, Walrus, Warwick, Watchman, Waterhen, Wessex, Westcott, Westminster, Whirlwind, Whitley, Winchelsea, Winchester, Wolfhound, Wolsey, Woolston, Wrestler, Wryneck.



GREAT BRITAIN. Destroyers. Whitehall, Whitshead, Wildswan, Witherington, Wivern, Wolverine, Worcester, Wishart, Witch.



GREAT BRITAIN. Destroyers. Ambuscade,  
Amazon.



GREAT BRITAIN. Flotilla Leader. Exmouth.



GREAT BRITAIN. Destroyers. Admiralty "G"  
class.

CHILE. Destroyers. Serrano, Orellia, Riqueime,  
Hyatt, Videla, Aldea.



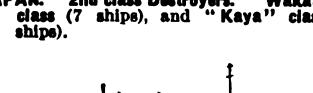
ITALY. Destroyers. Palestro, San Silvestre,  
Martino, Confindenza.



SWEDEN. Destroyers. Klas Horn, Klas Uggla,  
Ehrensköld, Nordenkjöld.



ITALY. Destroyers. Turbine. Nenbo, Eure,  
Boreo, Espero, Ostro, Zaffiro, Aquilonio,  
N. Sauro, F. Nullo, D. Manin, C. Battisti.



JAPAN. 2nd class Destroyers. "Wakatake"  
class (7 ships), and "Kaya" class (19  
ships).



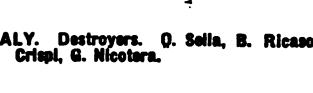
DENMARK. Torpedo Boats (1st Class). Glertia,  
Hogen, Ormen, Laxen, Dragen, Hvalen.



FRANCE. Destroyers. Aventurier, Intrépide.



ITALY. Destroyers. Dardo, Freccia, Strale,  
Setta, Folgore, Lampe, Baleno, Fulmine.



ITALY. Destroyers. Alessandro Poerio and  
Guglielmo Pepe.



GREECE. Destroyers. Hydra, Spetsai, Psara  
and Coundouriotis.

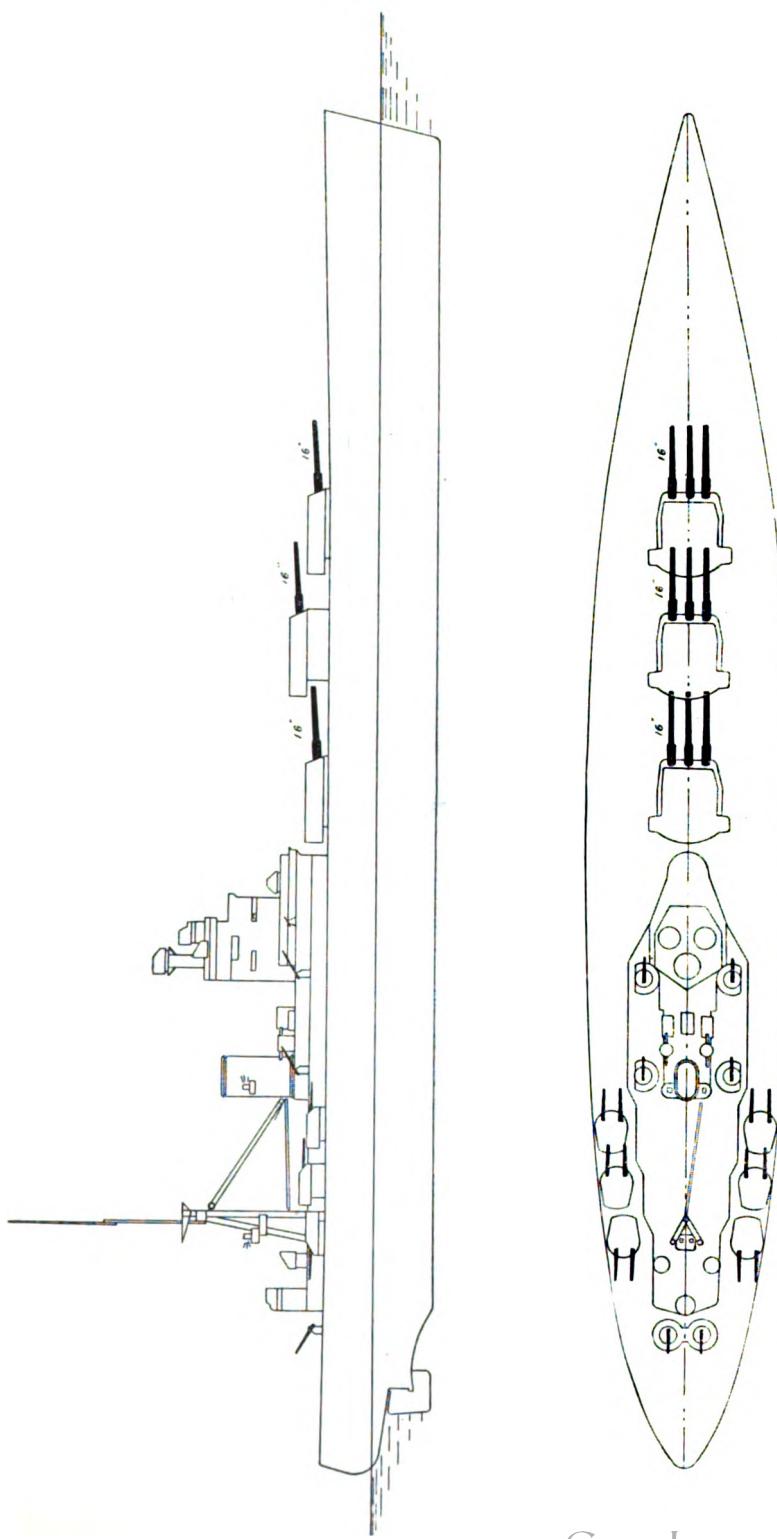
**PLANS  
OF  
BRITISH AND FOREIGN WARSHIPS.**



GREAT BRITAIN.

BATTLESHIPS.

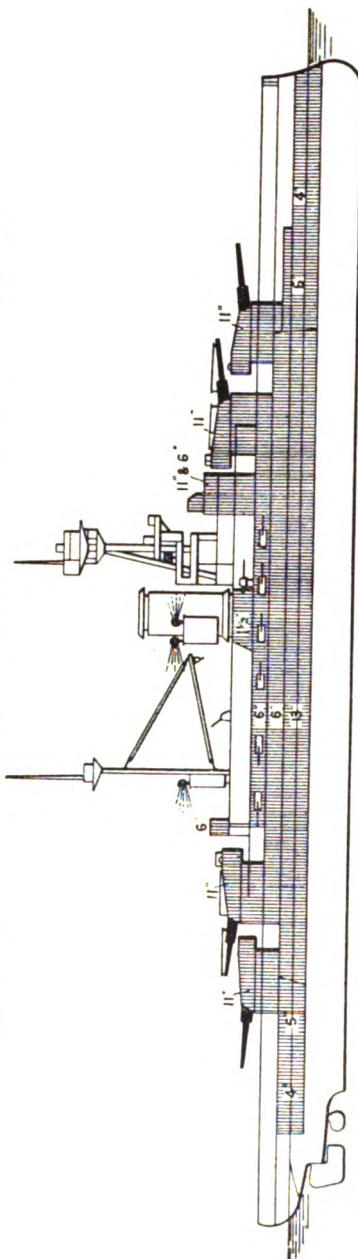
Nelson.      Rodney.



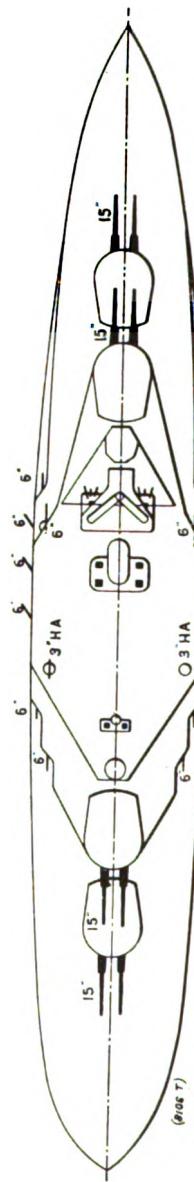
Length (extreme), 710 ft.; Rodney, 33,500 tons; Speed, 23 knots.  
Armament, 0-16-in. ; 12-6-in. ; 6-4.7-in. ; 6-3-pr. ; 6-2-pr. Pom Poms ; 11 L. ; 5 M. ; 2 24-in. submerged torpedo tubes.  
NOTE.—A 14-in. waterline armour belt extends from approximately the foremost 16-in. turret to approximately the aftermost 6-in. turret. The turret armour varies from 16-in. to 9-in.

## GREAT BRITAIN.

BATTLESHIPS.  
Royal Sovereign.      Royal Oak.      Revenge.      Resolution.      Ramillies.



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Length (extreme), 620 ft. 6 ins. • ; Length B.P., 680 ft. ; 29,150 tons ; Speed, 22 knots (without bulges) ; Completed, 1916-17.

Armament, 8—15 in. ; 12—6 in. ; 4—4-in. A.A. ; 4—3-pr. ; 6 M. ; 11 L. ; 2—21-in. submerged torpedo tubes.

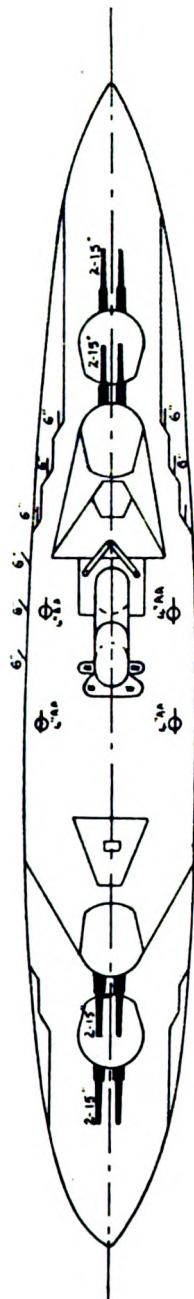
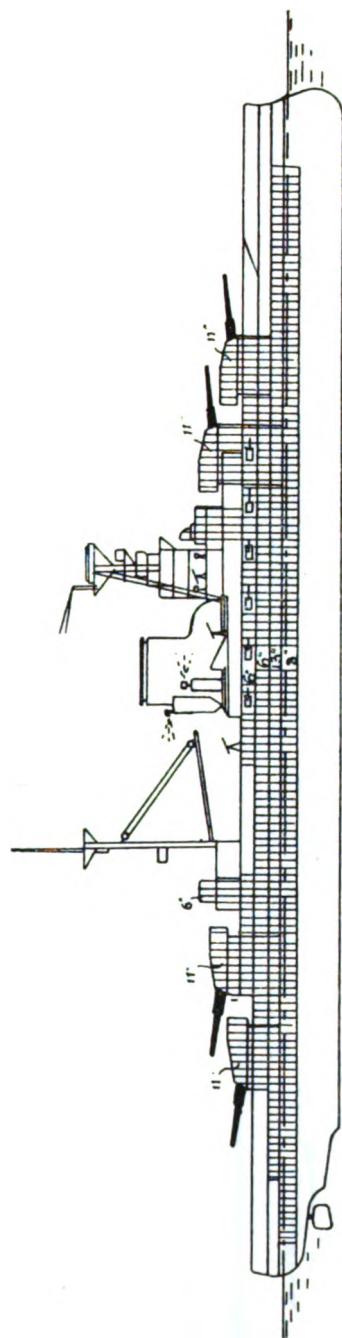
Corrections to plan :-Searchlights on mainmast and the superstructure 6-in. guns now removed. Four 4-in. A.A. guns are fitted on the superstructure instead of the 3-in. H.A. known.

• Revenge, 625 ft. 9 in.

**GREAT BRITAIN.**

**BATTLESHIPS.**

Queen Elizabeth. Warspite. Barham.  
(As reconstructed 1920-31.)

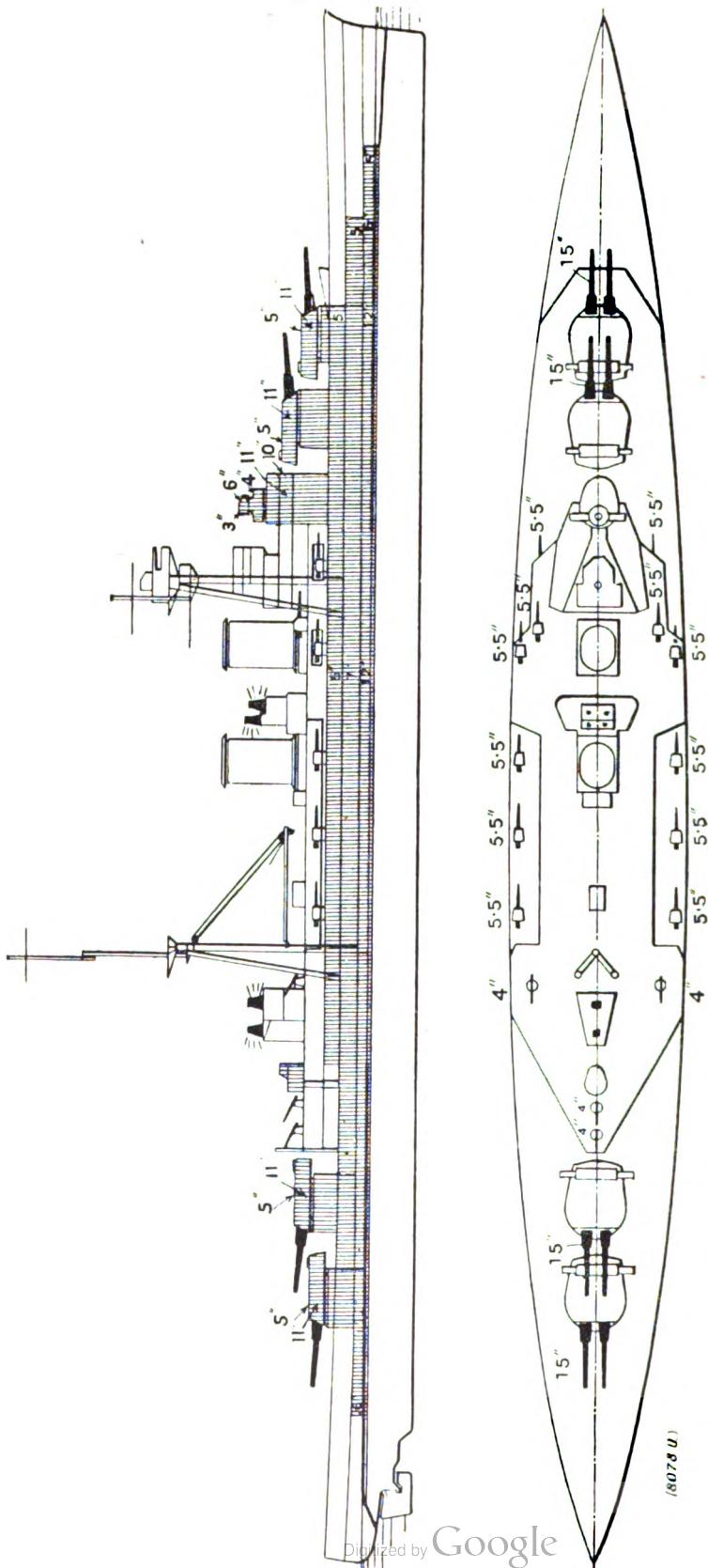


Length B.P. 600 ft. (extreme 630'-644 ft.); 31,100 tons; Speed, 25 knots (without bulges); Completed, 1915-1916.  
Armament, 8-in.; 12-6-in.; 12-3-in.; 4-4-in. A.A.; 4-3-pr. M.; 11 L.; 2-21-in. submerged torpedo tubes.

GREAT BRITAIN.

**BATTLE-CRUISER.**

Hood.



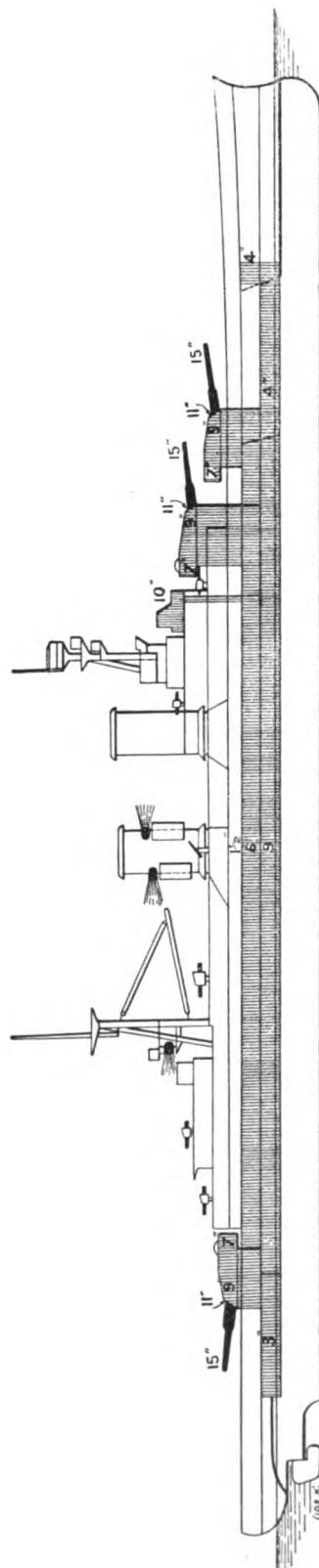
Length (extreme), 800 ft. 10 ins.; Length B.P., 810 ft.; Displacement, 21,100 tons; Speed, 31\* knots; Completed, 1920.  
Armament, 8-16-in.; 12-5.5-in.; 4-4-in. A.A.; 4-3-pdr.; 5 M.; 11 L.; 4 A.W. and 2 sub. 21-in. torpedo tubes.

\* Trials at 44,900 tons, 31.80 knots with 161,000 S.H.P.

GREAT BRITAIN.

BATTLE-CRUISERS.

Banana



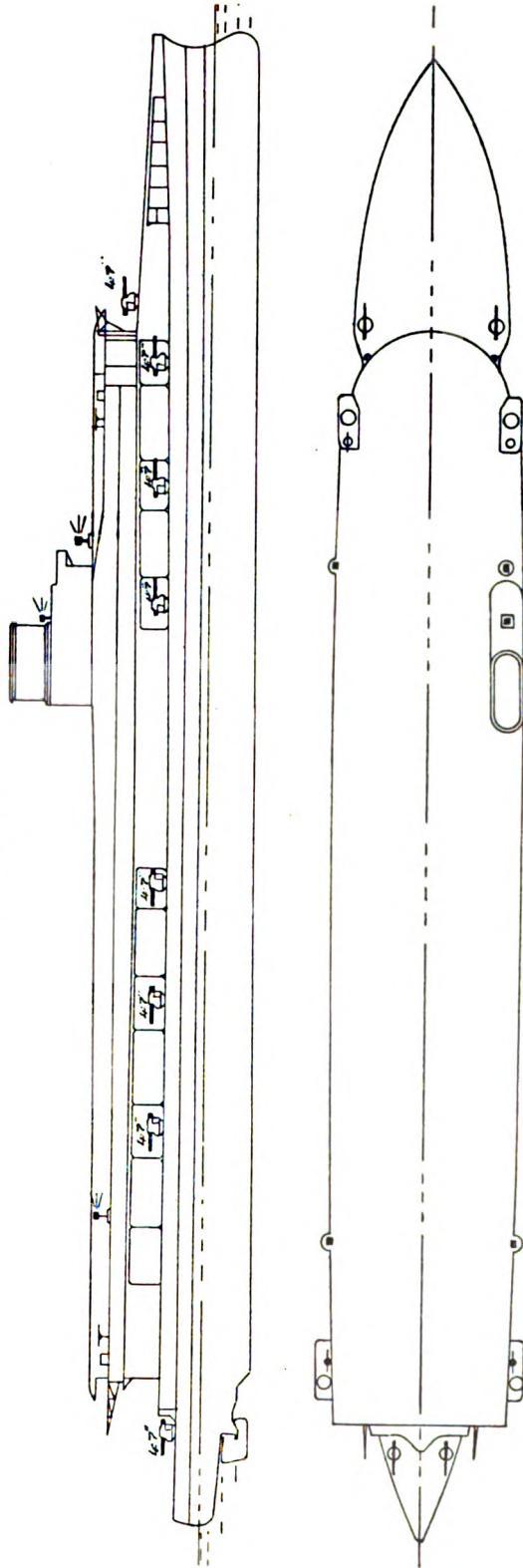
**Lengh (extreme)**, 704 ft. 2 ins.; **Length B.P.**, 750 ft.; **Speed**, 31.5 knots (without bulges); **Completed**, 1916. **Armament**, 6-15-in., 4-8-pr., 4-4-in., 4-12-pdr. guns; 2 submerged torpedo tubes (the Renown has 8 a.w. in addition). **N.M.R.**—Repulse originally had a 6-in. main belt, but was re-armoured in 1920-21. Re-armouring of the Renown was completed during 1926-7.

## GREAT BRITAIN.

## AIRCRAFT CARRIERS.

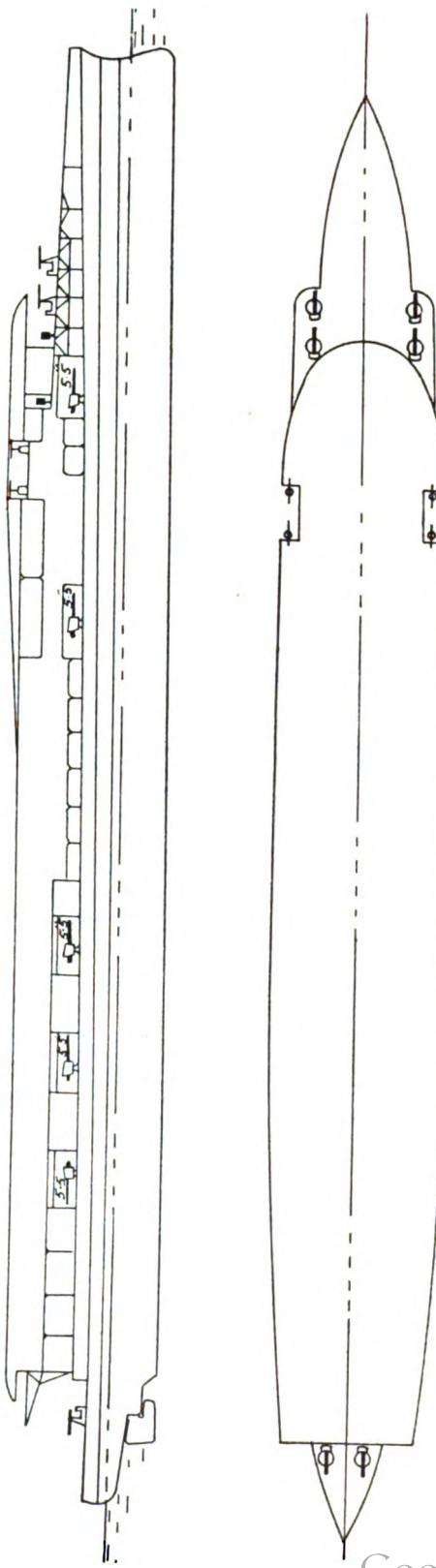
Glorious.

Courageous.



Length (extreme), 786 ft, 3 ins.; 22,500 tons; Speed, 30 knots; Launched as cruisers (1916); converted to aircraft carriers (completed 1928 and 1930 respectively).  
Armament, 16—4.7-in.; 4—3-pr.; 4—2-pr. pom-poms; 4 M.; 42 h.

GREAT BRITAIN.  
AIRCRAFT CARRIER,  
Furious.

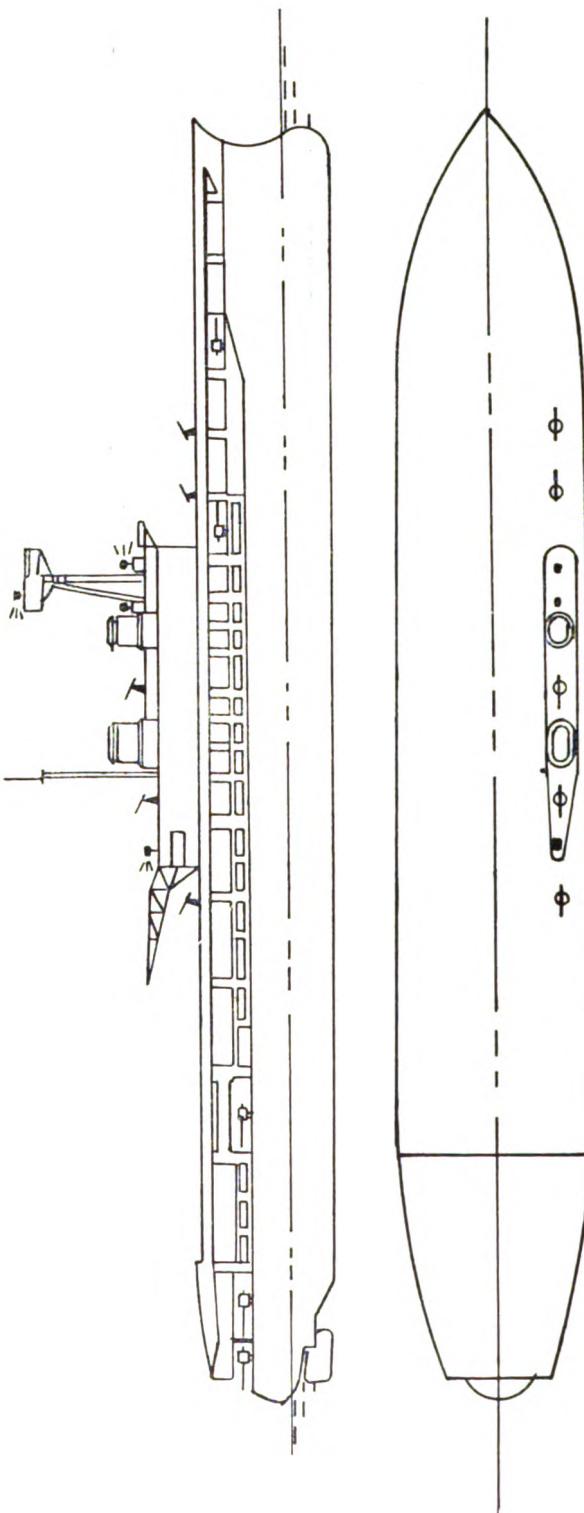


Length (extreme), 86 ft. 6 ins.; 22,450 tons; Speed, 31 knots; Completed as a cruiser, 1917; Conversion to aircraft carrier completed 1925.  
Armament, 10-5-in.; 3-4-in. A.A.; 4-3-pr.; 4-2-pr.; 46 smaller.

GREAT BRITAIN.

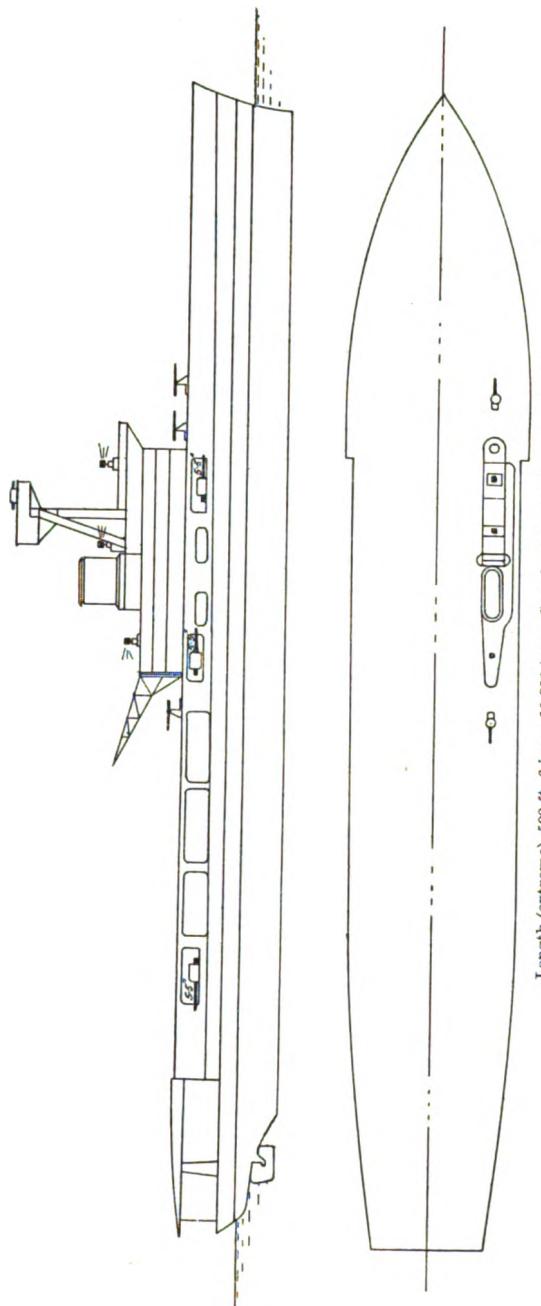
## AIRCRAFT CARRIER.

Eagle.



Length (extreme), 667 ft. 6 ins.; 22,600 tons; Speed, 24 knots; Completed as an aircraft carrier, 1924.  
Armament, 9-6-in.; 5-4-in. A.A.; 4-3-pr.; 32 smaller.

GREAT BRITAIN.  
AIRCRAFT CARRIER.  
Hermes.

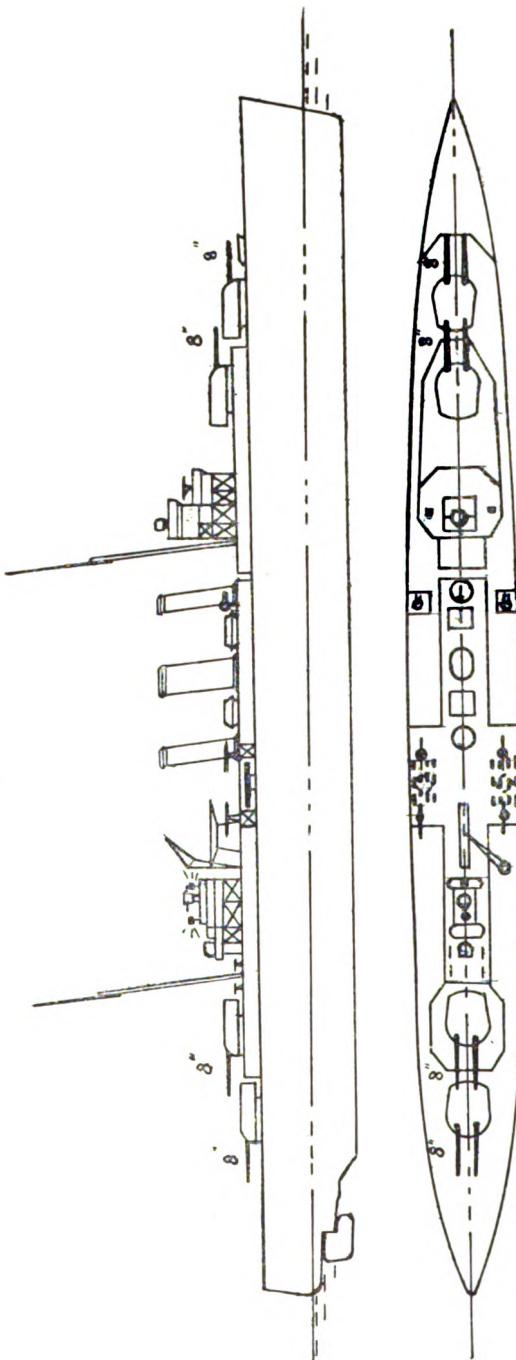


Length (extreme), 599 ft. 6 ins.; 10,850 tons; Speed, 23 knots; Completed 1924.  
Armament, 6—5½-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 M.; 16 L.

## GREAT BRITAIN.

## CRUISERS.

London.	Sussex.	Shropshire.	Devonshire.
"London" Class.	"Norfolk" Class.	"Norfolk" Class.	"Norfolk" Class.



Displacements, 9,730-9,900 tons; Length (extreme), 630 ft.; Norfolk and Dorsetshire, 633 ft. Armament, 8-8-in., 4-4-in. A.A.; 4-3-pr.; 4-2-pr. Pom Poms; 4 M.; 8 L.; 8-21-in. torpedo tubes.

\* In Dorsetshire and Norfolk the seaplane crane and the 4-4-in. guns are slightly forward of the positions shown.

## GREAT BRITAIN.

## CRUISERS.

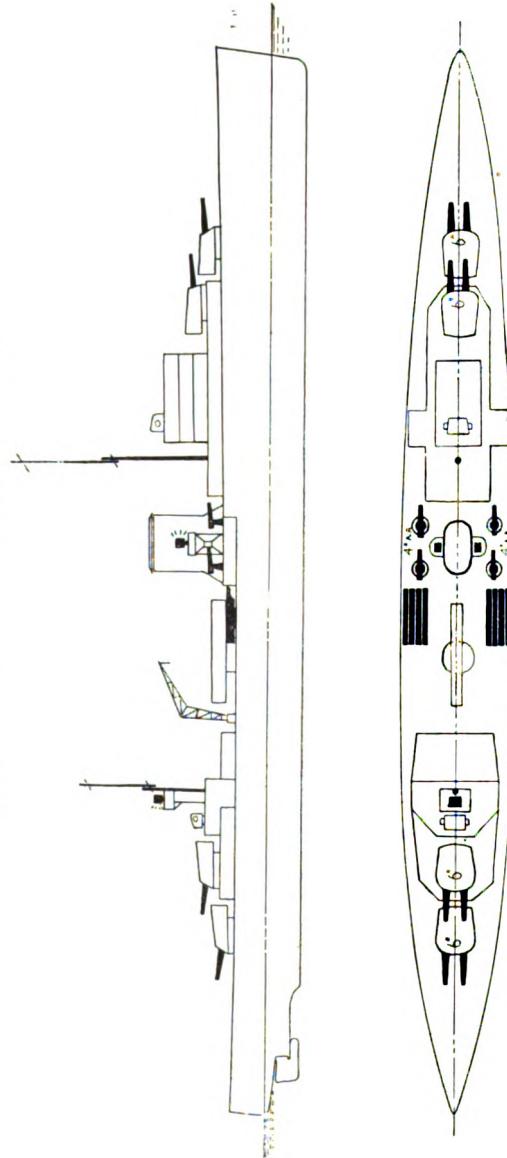
*"Leander" Class.*

Leander.

Achilles.

Neptune.

Orion.



Displacement, 7,000 tons; Length (extreme), 554 ft. 6 ins.; Speed 32½ knots. Armament 8—6-in., 4—4-in. A.A., 4—3-pr., 8 torpedo tubes.

Leander and Achilles, completed 1883. Neptune and Orion, completed 1884.

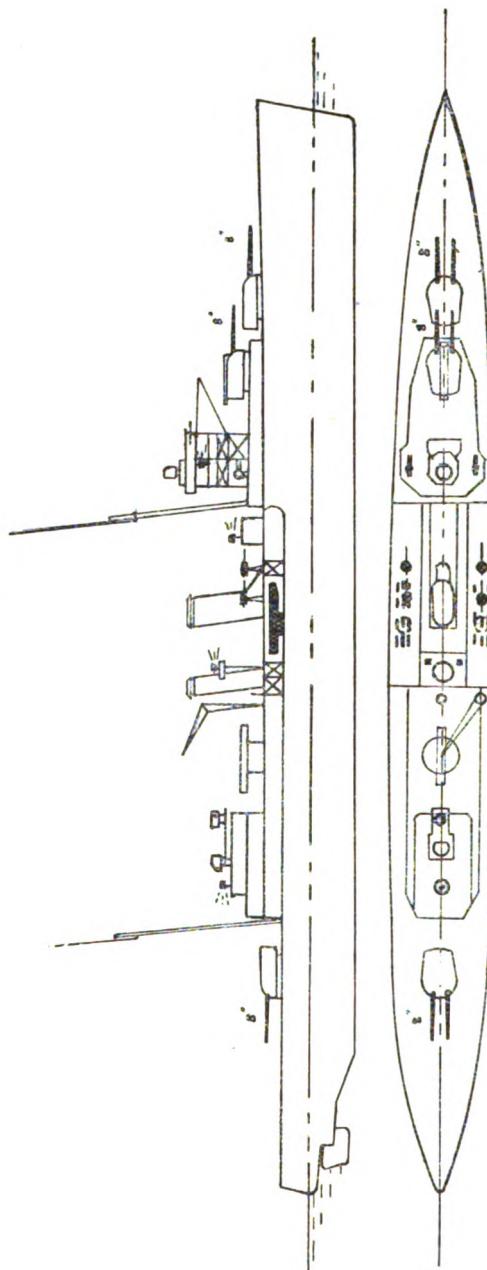
## GREAT BRITAIN

## CRUISERS.

"York" Class.

York.

Exeter.\*



Displacement : York, 8,250 tons ; Exeter, 8,300 tons ; Length (extreme), 575 ft ; Speed: York, 224 knots ; Exeter, 22 knots. Armament, 6-8-in. 4-4-in. A.A. ;  
 $\frac{4}{4}$ -3-pr. ; 2-2-pr. ; 4 M ; 8 L ; 6 - 21-in. torpedo tubes.

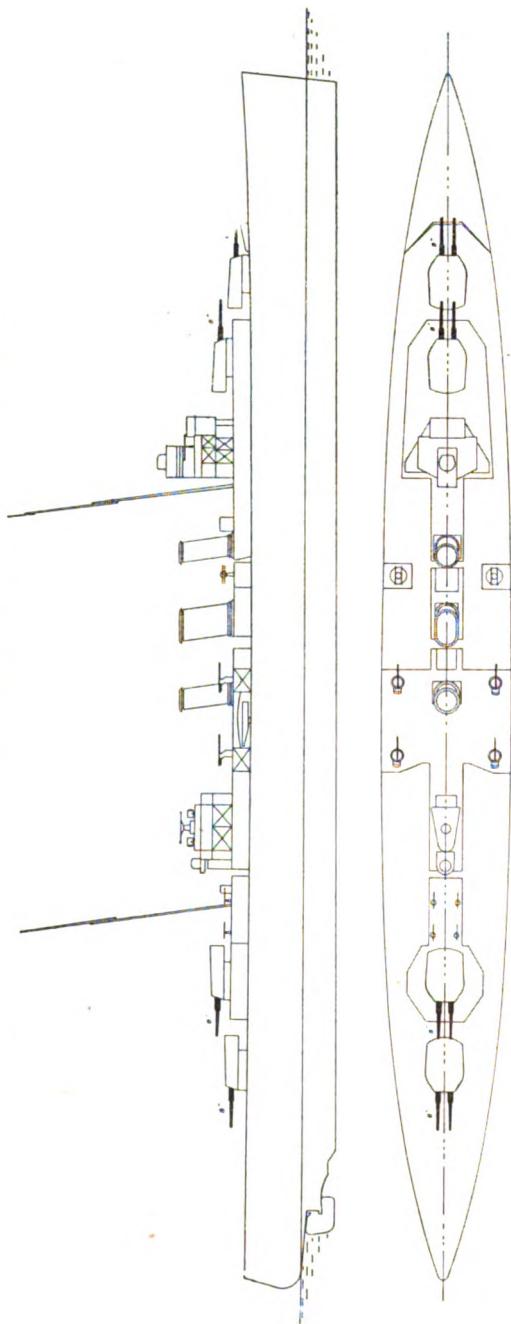
\* In Exeter funnels and masts are vertical, and the mainmast is taken up through the superstructure.

## GREAT BRITAIN.

## CRUISERS.

*"Kent" Class.*

Kent,	Berwick,	Cumberland,	Suffolk,	Cornwall,	Australia *	Canberra *
-------	----------	-------------	----------	-----------	-------------	------------



Length (extreme), 630 ft.; B.P., 590 ft.; 9,750 to 9,870 tons; Speed, 31½ knots.  
Armament, 8-8-in.; 4-4-in. A.A.; 4-3-pr.; 4-2-pr. Pom Poms; 4 M.; 8 L.; 2 Q.R. 21-in. torpedo tubes.

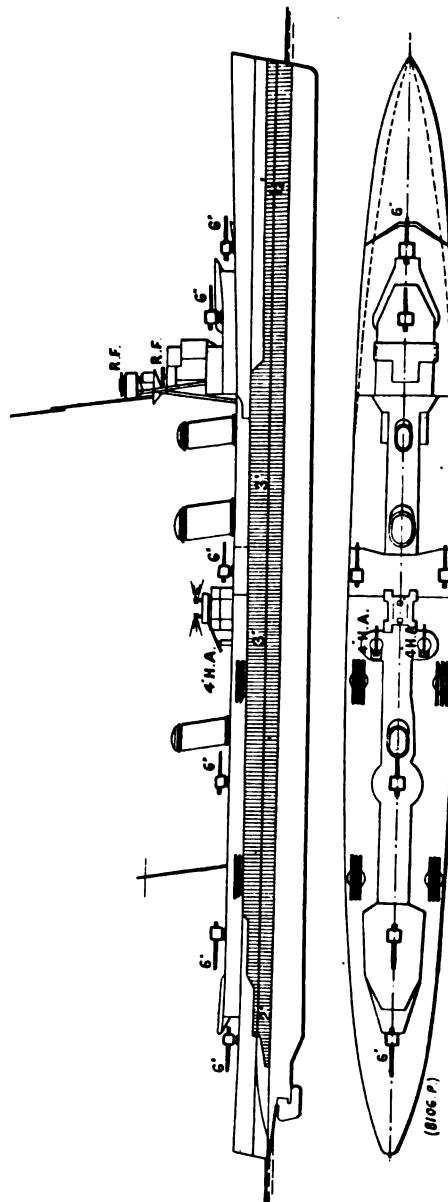
\* H.M. Australian Navy.

## GREAT BRITAIN.

CRUISERS.

"E" Class.

Emerald. Enterprise.\*



Length (extreme), 570 ft.; Length B.P., 535 ft.; Emerald, 7,650 tons; Enterprise, 7,680 tons; Speed, 33 knots.  
 Armament, 7-6-in.; 3-4-in. A.A.; 4-3-pr.; 2-2-pr. Pom Poms; 2 M.; 8 L.; 16-21-in. torpedo tubes.

Correction to Plan: The torpedo tubes are in quadruple sets.  
 • In Enterprise the two forward 6-in. guns are mounted in a twin-mounting on forecastle deck.

## GREAT BRITAIN.

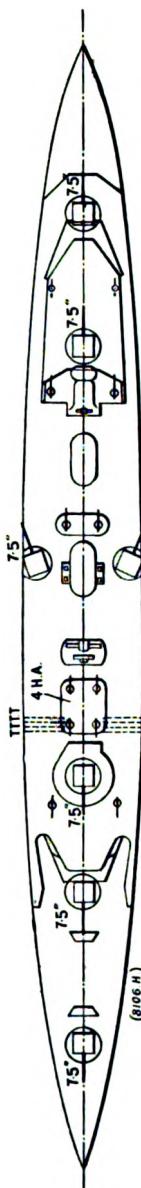
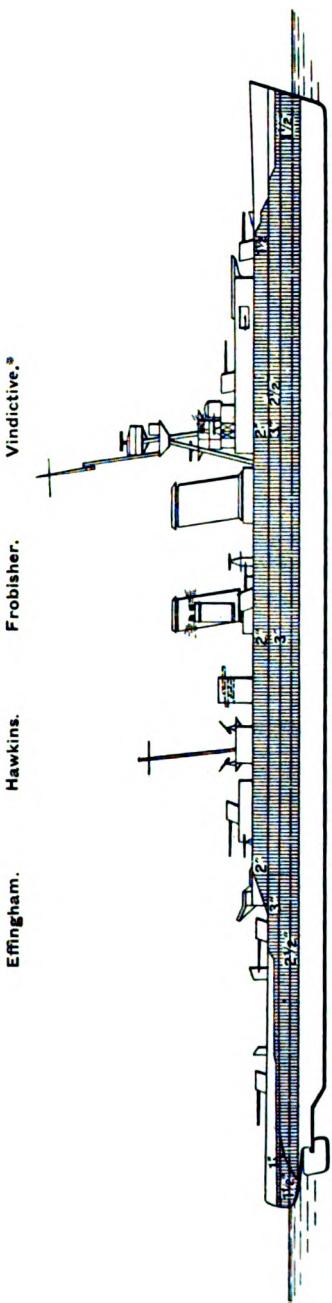
## CRUISERS.

*Improved "Birmingham" Class.*

## Effingham.

## Frobisher.

## Hawkins.



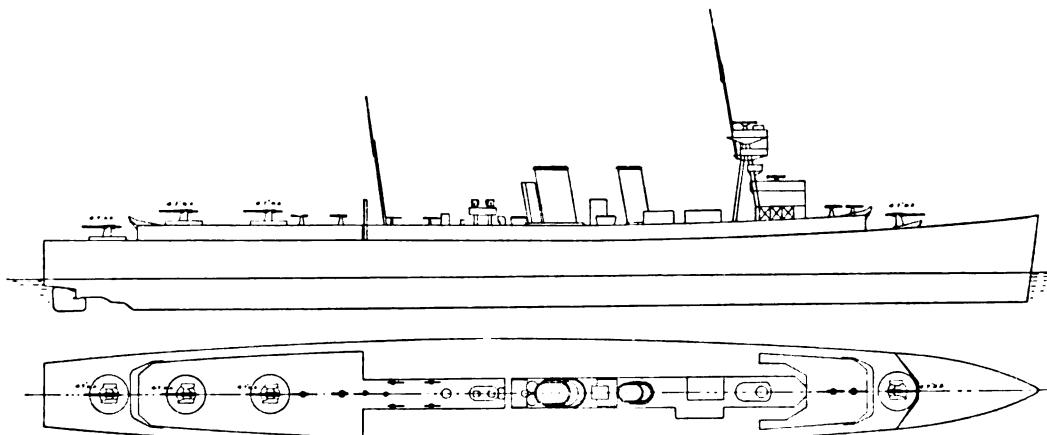
Length (extreme), 605 ft.; Length B.P., 565 ft.; 9,770—9,996 tons; Speed: Effingham and Frobisher 30½ knots; Vindictive 30 knots; Hawkins 29½ knots.  
 Armament: Effingham: 7—7½-in. A.A.; 3—4-in. A.A.; 4—3-pr.; 2 M.; 8 L.; 5 torpedo tubes. Frobisher: 6—7½-in.; 2—4-in. A.A.; 4—3-pr.; 2 M.; 8 L.; 2 torpedo tubes. Hawkins: 7—7½-in.; 4—4-in. A.A.; 4—3-pr.; 2 M.; 2 L.; 6 torpedo tubes. Vindictive: 6—7½-in.; 3—4-in. A.A.; 4—3-pr.; 2—2-pr.; 2 M.; 8 L.; 6 torpedo tubes.

- \* Vindictive has an aircraft hangar mounted forward of the bridge, and to accommodate this the raised 7½-in. gun forward has been removed.
- \* Frobisher is now employed as Cadets' Sea-going Training Ship.

GREAT BRITAIN.

CRUISER MINELAYER.

*Adventure.*



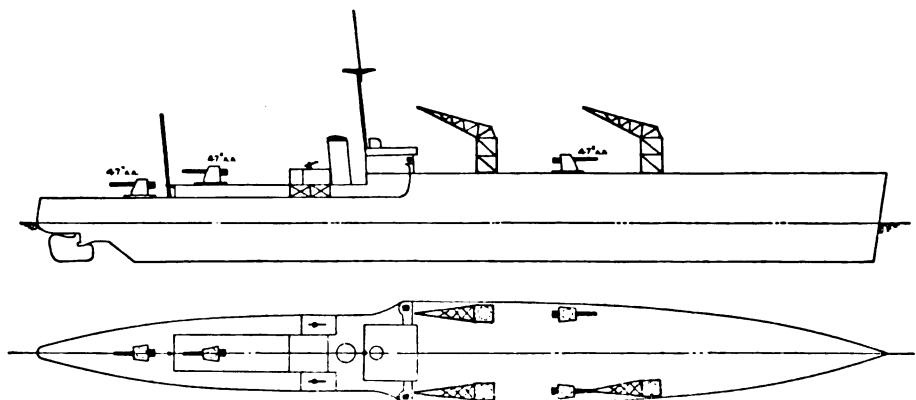
Length (extreme), 539 ft.; Length B.P., 500 ft.; 6,800 tons; Speed, 27½ knots.  
Armament, 4—4·7-in. A.A.; 4—3-pr.; 4—2-pr.; 2 M.; 8 L.; 310 mines.

(Stern has been extended.)

ROYAL AUSTRALIAN NAVY.

SEAPLANE CARRIER.

*Albatross.*



Length, 443½ ft.; 4,800 tons; Speed, 21 knots; Completed 1929.  
Armament, 4—4·7-in. A.A.; 4—2-pdr. Pom Poms; 4—3-pdr.; 4 M.; 4 L.; 6 seaplanes.

## GREAT BRITAIN.

## CRUISERS.

*"D" Class.*

\*Despatch.

\*Diomede.

Danae.

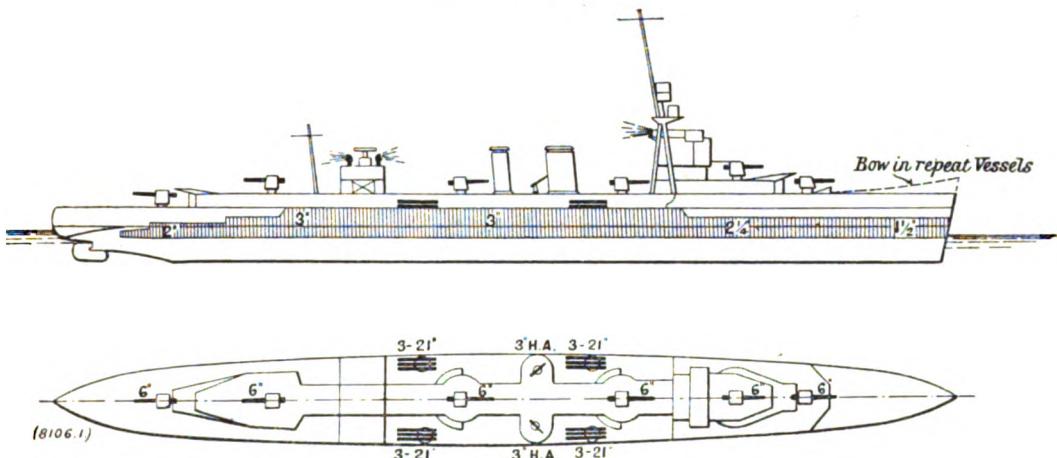
\*Dunedin.

Dauntless.

\*Durban.

Dragon.

\*Delhi.



Length, 4724 ft.; 4,850 tons; Speed, 29 knots;  
Armament, 6—6-in.; 3—4-in. A.A.; 4—3-pr., 2—2-pr.; 2 M.; 8 L.; 12—21-in. torpedo tubes.

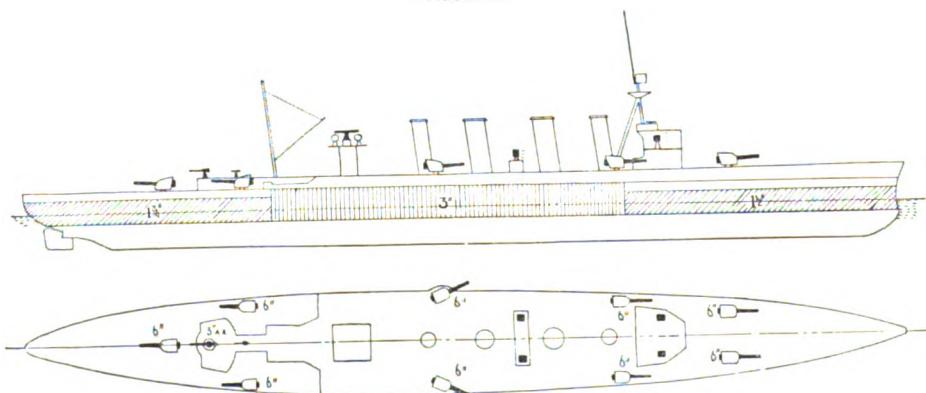
Diomede and Dunedin are attached to the New Zealand Division.

\* Repeat vessels.

## ROYAL AUSTRALIAN NAVY.

## CRUISER.

Adelaide.



Length, 462 $\frac{1}{2}$  ft.; 5,100 tons; 25 knots.  
Armament, 9—6-in.; 4—3 pr.; 1—3-in. A.A.; 2 submerged 21-in. torpedo tubes.

## GREAT BRITAIN.

## CRUISERS.

Ceres.

Curacao.

"Ceres" Class.

Curlew.

Cardiff.

Coventry.

\*Cairo.

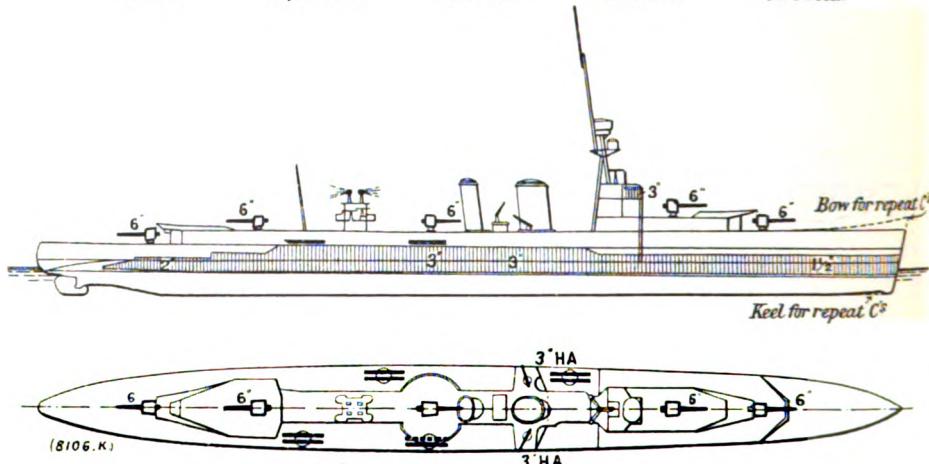
\*Cape Town.

"Carlisle" Class.

\*Carlisle.

\*Colombo.

\*Calcutta.



Length (extreme), 450 ft. (451 ft. 9 ins. Repeat Vessels); Length B.P., 425 ft.; 4,290 tons; Repeat vessels, 4,200 tons; Speed, 29 knots; Completed, 1917-18 (Repeat Vessels, 1918-22).

Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 4 above-water 21-in. D.R. torpedo tubes. Cardiff, Curacao, and Ceres have 2—3-pr.

\* Repeat vessels.

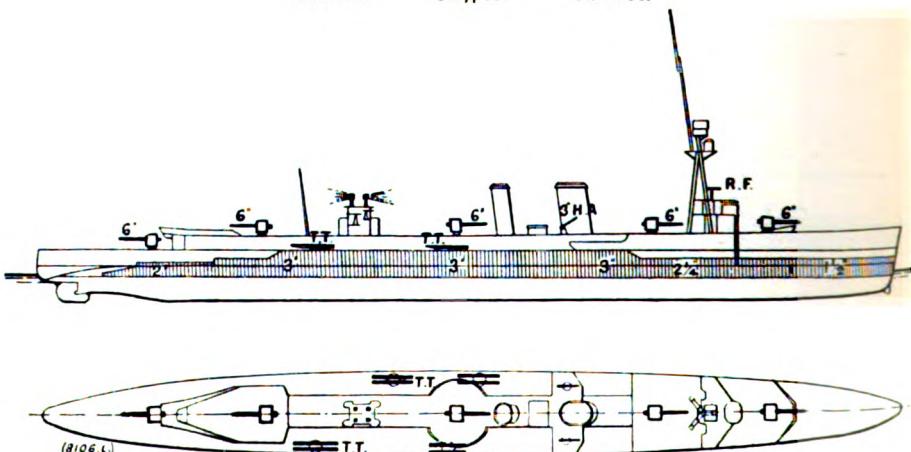
## CRUISERS.

"Caledon" Class.

Caledon.

Calypso.

Caradoc.

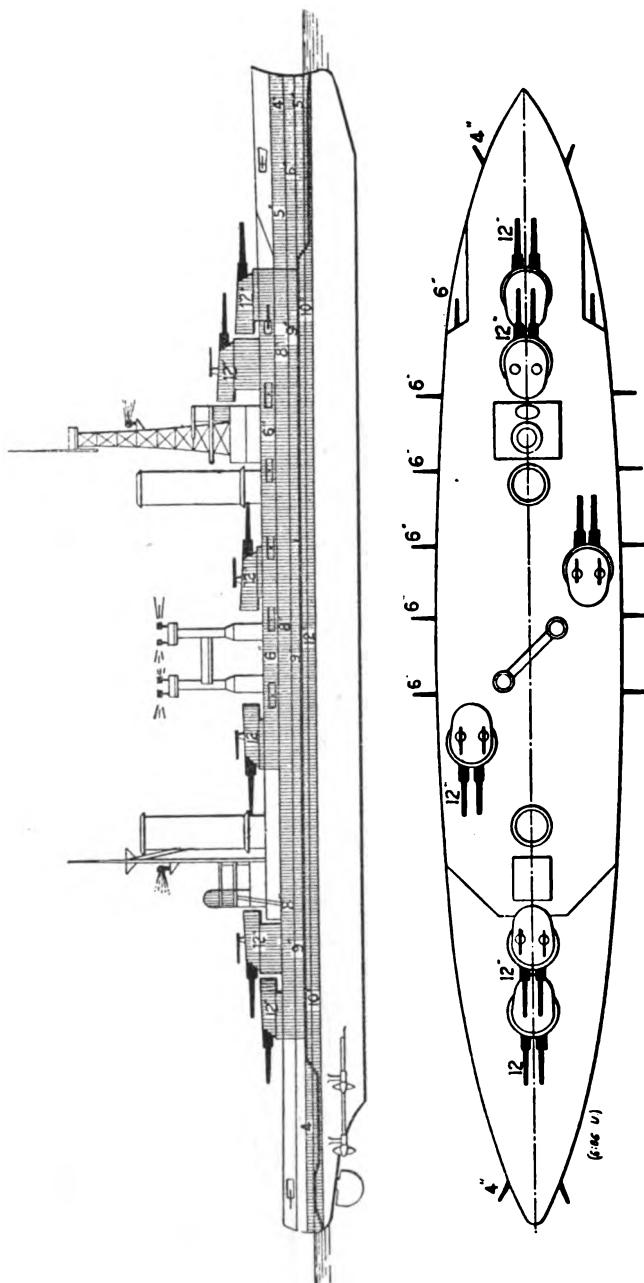


Caledon } Length (extreme), 450 ft.; Length B.P., 425 ft.; 4,180 tons; Speed, 29 knots; Completed, 1917.  
 Calypso } Armament, 5—6-in.; 2—3-in. A.A.; 4—3-pr.; 2—2-pr. Pom Poms; 2 M.; 8 L.; and 4 above-water 21-in.  
 Caradoc } D.R. torpedo tubes.

## ARGENTINE.

## BATTLESHIPS.

Moreno.      Rivadavia.



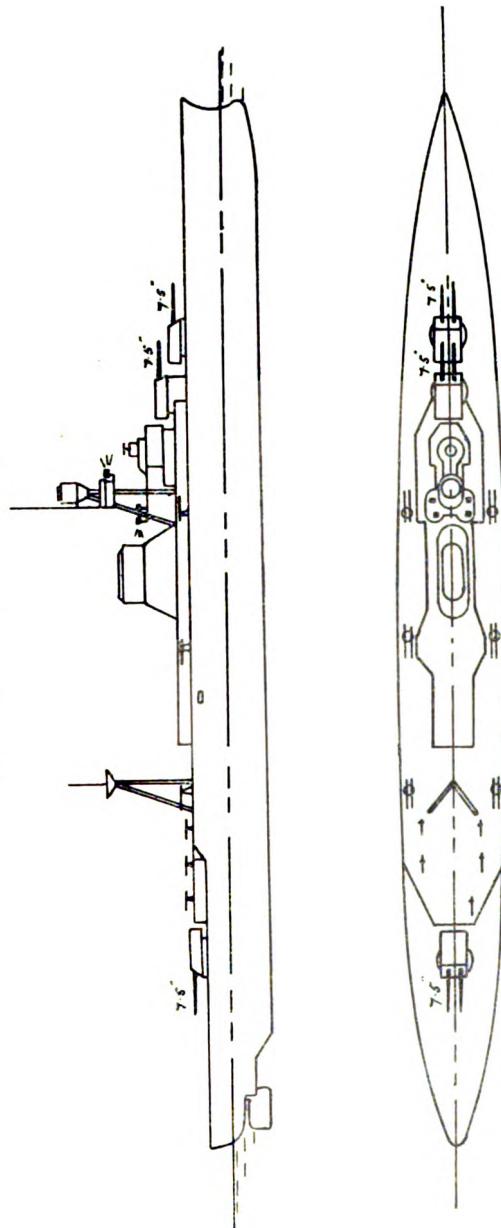
Length (extreme), 665 ft.; Length on W.L., 576 ft.; 27,720 tons; Speed, 22½ knots; Completed, 1914-16  
Armament, 12—12-in.; 12—6-in.; 4—3-pr.; 6 M.; 4 L.; 2 submerged 21-in. torpedo tubes.

## ARGENTINE.

CRUISERS.

Almirante Brown.

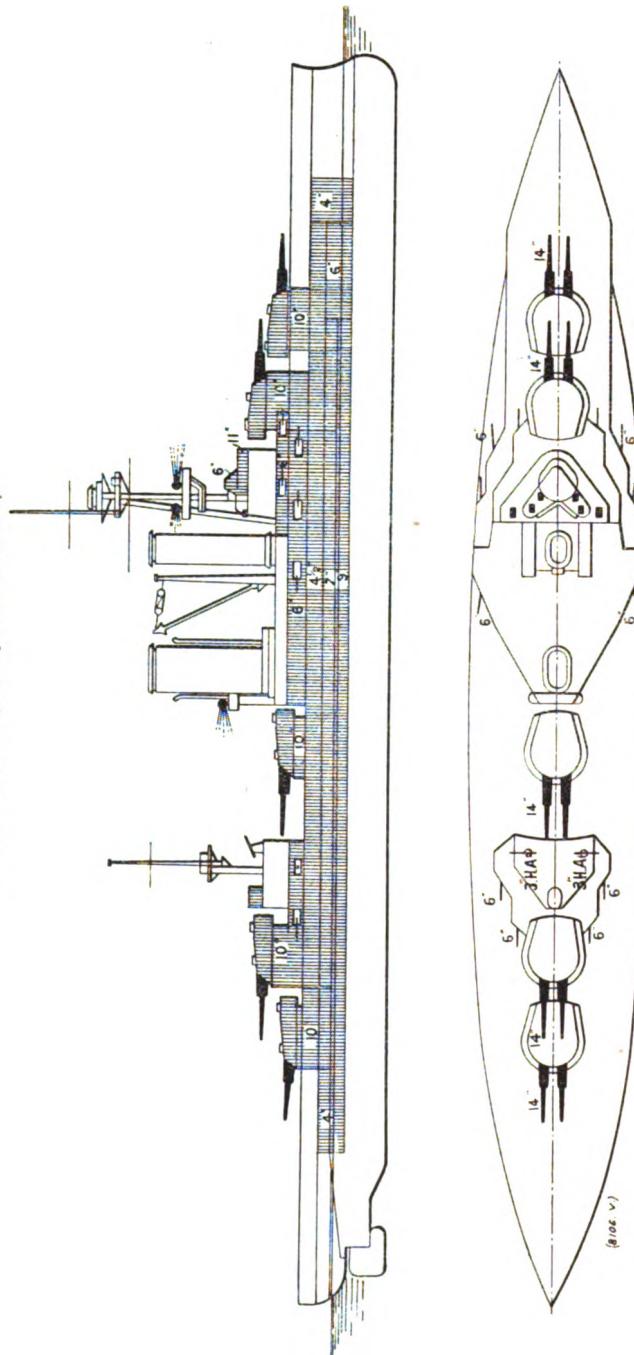
25 Mayo.



Length (extreme), 545 $\frac{1}{4}$  ft.; 6,495 tons; Speed, 22 knots. Completed 1931.  
 Armament, 6—7.5-in.; 12—4-in. A.A.; 6 Pom Poms; 6 21-in. torpedo tubes.  
 1 catapult; 2 seaplanes.

## CHILE.

## BATTLESHIP.

Almirante Latorre (*formerly H.M.S. Canada*).

Length (extreme), 661 ft.; Length B.P., 625 ft.; 33,200 tons; Speed, 23 knots; Completed, 1915; Modernised at Devonport Dockyard 1929-31.\*  
Armament, 10-14-in.; 14-6-in.; 2-3-in. A.A.; 4-3-pr.; 4 submerged 21-in. torpedo tubes.

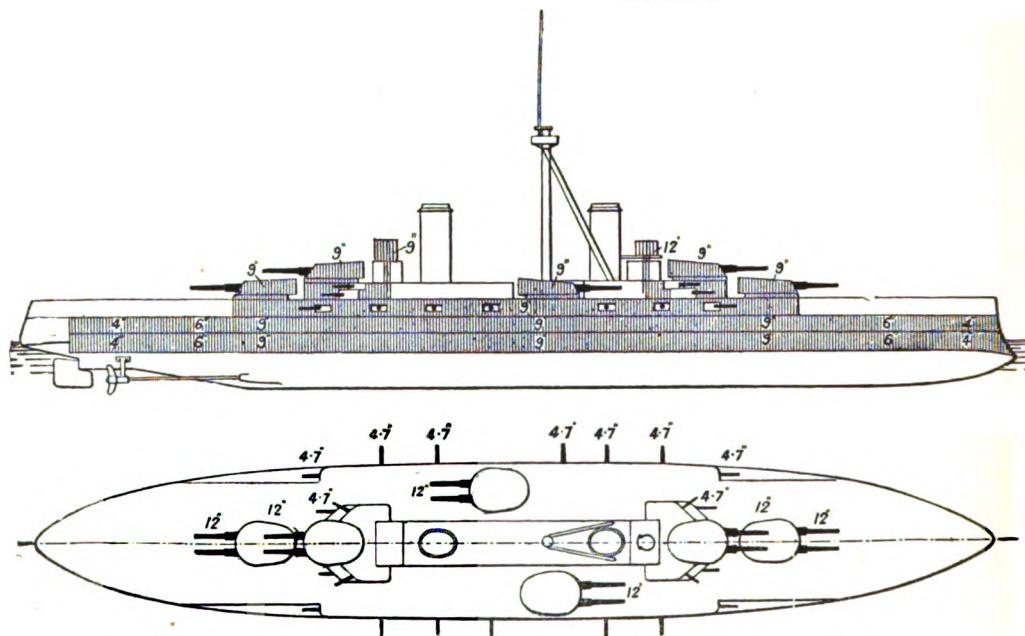
\* During modernisation main topmast has been raised and bridge platforms extended.

## BRAZIL.

## BATTLESHIPS.

Minas Geraes.

São Paulo.



Length (extreme), 543 ft.; Length B.P., 500 ft.; 19,200 tons; Speed, 21 knots; Completed, 1909, 1910.  
 Armament, 12—12-in.; 12—4.7-in.; 6—3-pr.; 2—3-in. A.A.; 4 M.

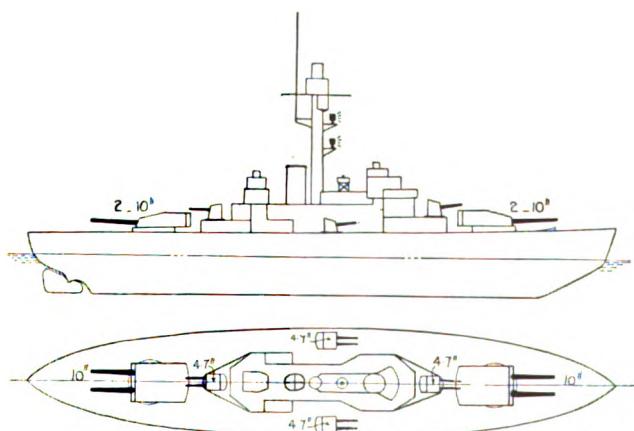
Overhauled and refitted at Brooklyn Navy Yard, 1921–22, and A.A. guns installed.  
 Correction to plan: Ten main deck 4.7-in. guns removed in 1931.

## FINLAND.

## ARMOURED GUNBOATS.

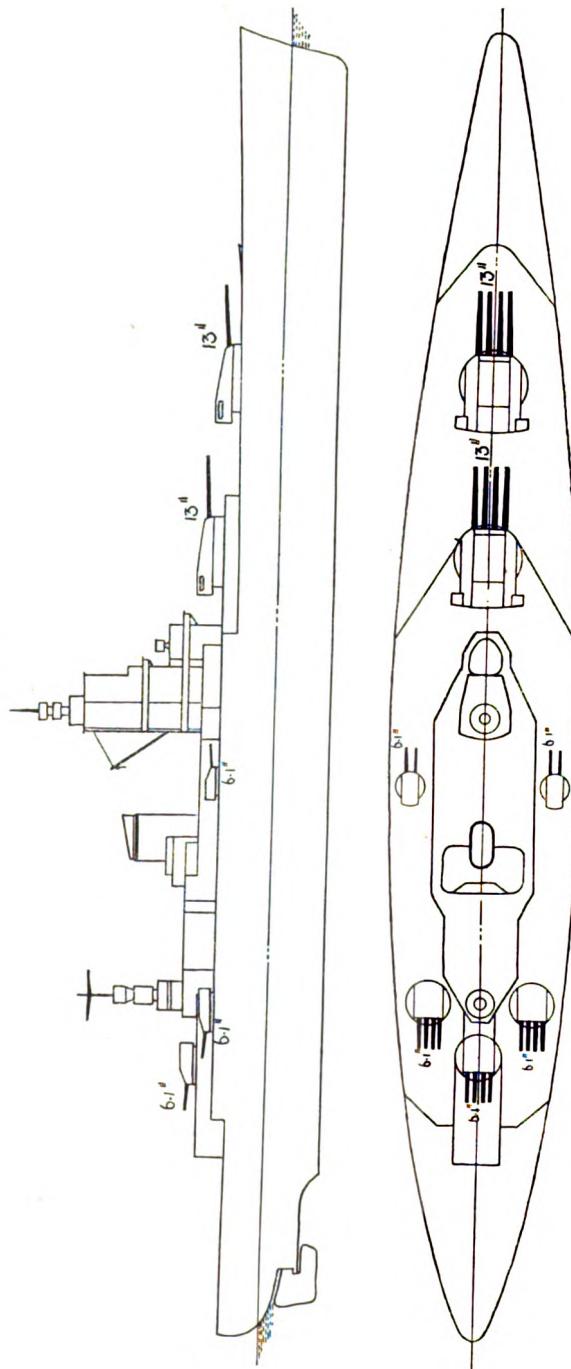
Väinämöinen.

Ilmarinen.

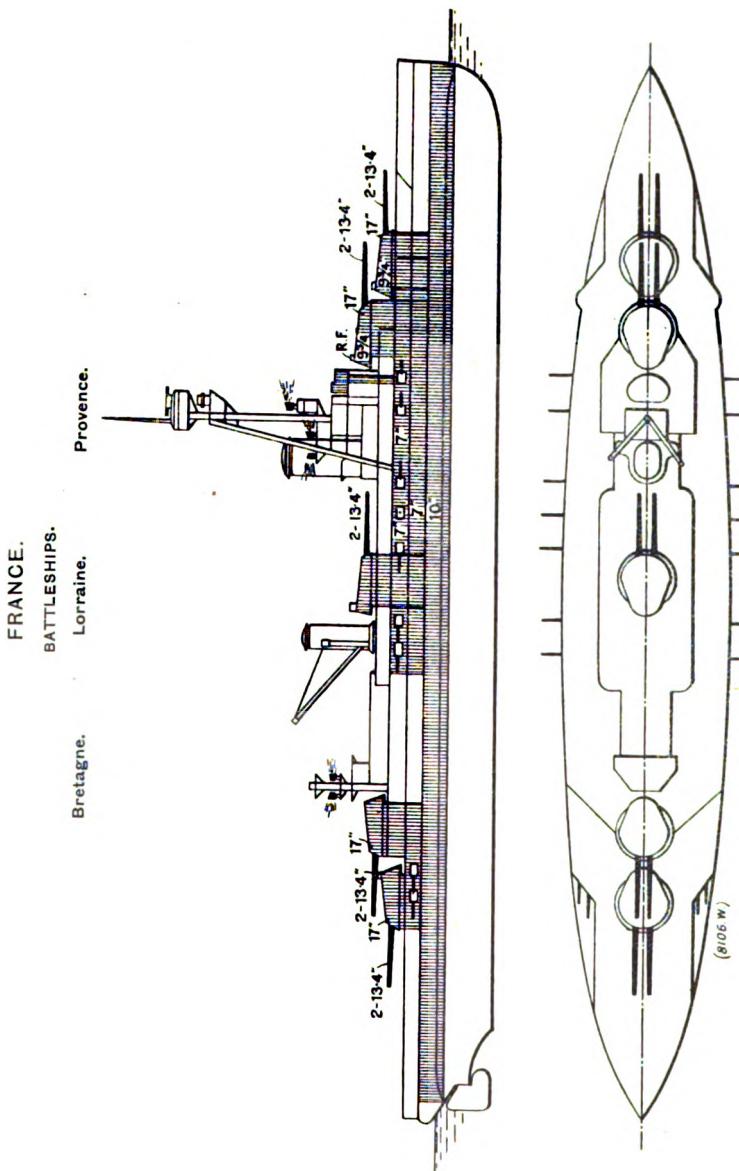


Length, 305 ft.; 4,000 tons; Speed, 15 knots.  
 Armament, 4—10-in.; 8—4.7-in.  
 Completed, 1932–33.

FRANCE.  
BATTLESHIP.  
Dunkerque.



Length, 685 ft.; 28,500 tons; Speed, about 29 knots.  
Armament, 8-13-in., 16-5.2-in., 40 smaller.  
Building at Brest.



Length (extreme), 544 ft. 6 ins. ; 22,180 tons; Speed, 20 knots; Completed, 1915-16; Modernised, 1925-27.  
Converted to oil burning, 1931.  
Armament, 10—13.4-in. ; 18—5.5-in. ; 4—3-in. A.A. ; 4—3 pr. ; 2—1-pr. ; 4 submerged 18-in. torpedo tubes.  
Correction to plan : The ships have now tall maintopmasts and no foretopmasts.

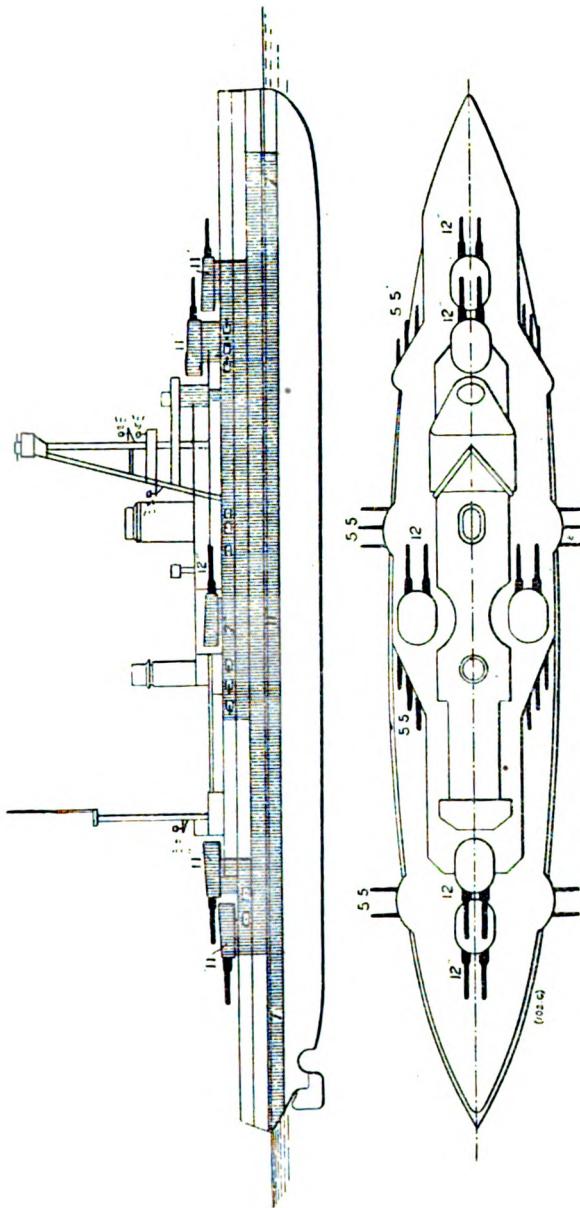
## FRANCE.

## BATTLESHIPS.

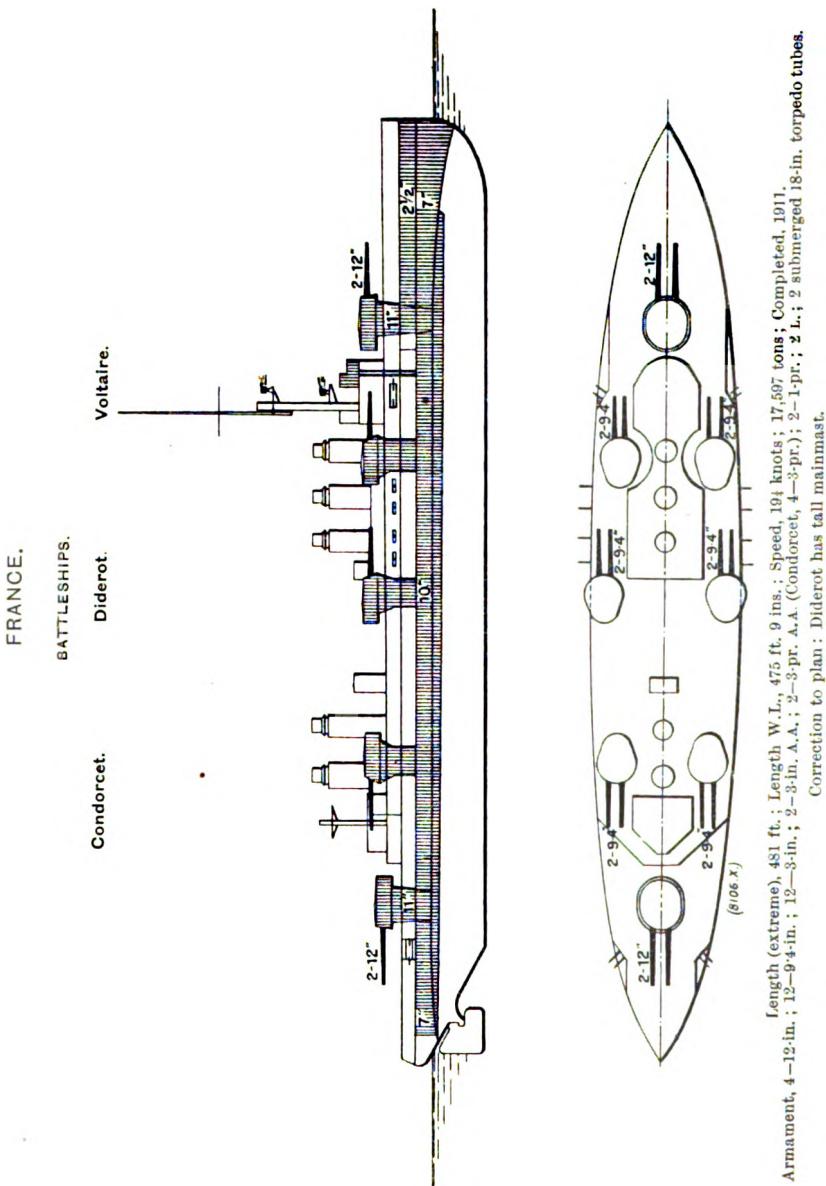
Jean Bart.

Courbet.

Paris.



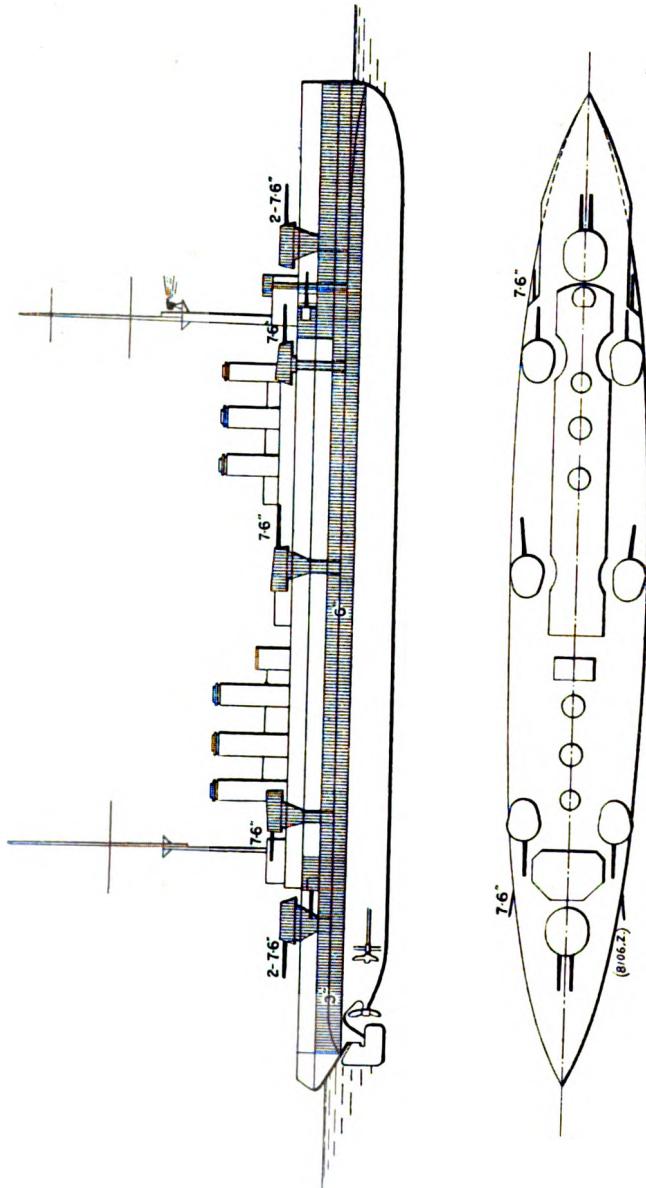
Length (extreme), 544 ft. 6 ins.; Length B.P., 541 ft. 4 ins.; 22,150 tons; Speed, 20 knots; Completed, 1912-14. Modernised in 1929.  
Converted to oil burning, 1931.  
Armament, 12-12-in.; 22-6-5-in.; 4-3-in. A.A.; 4-3-pr. (Courbet has 3-3-pr); 2-1-pr; 4 submerged 18-in. torpedo tubes.



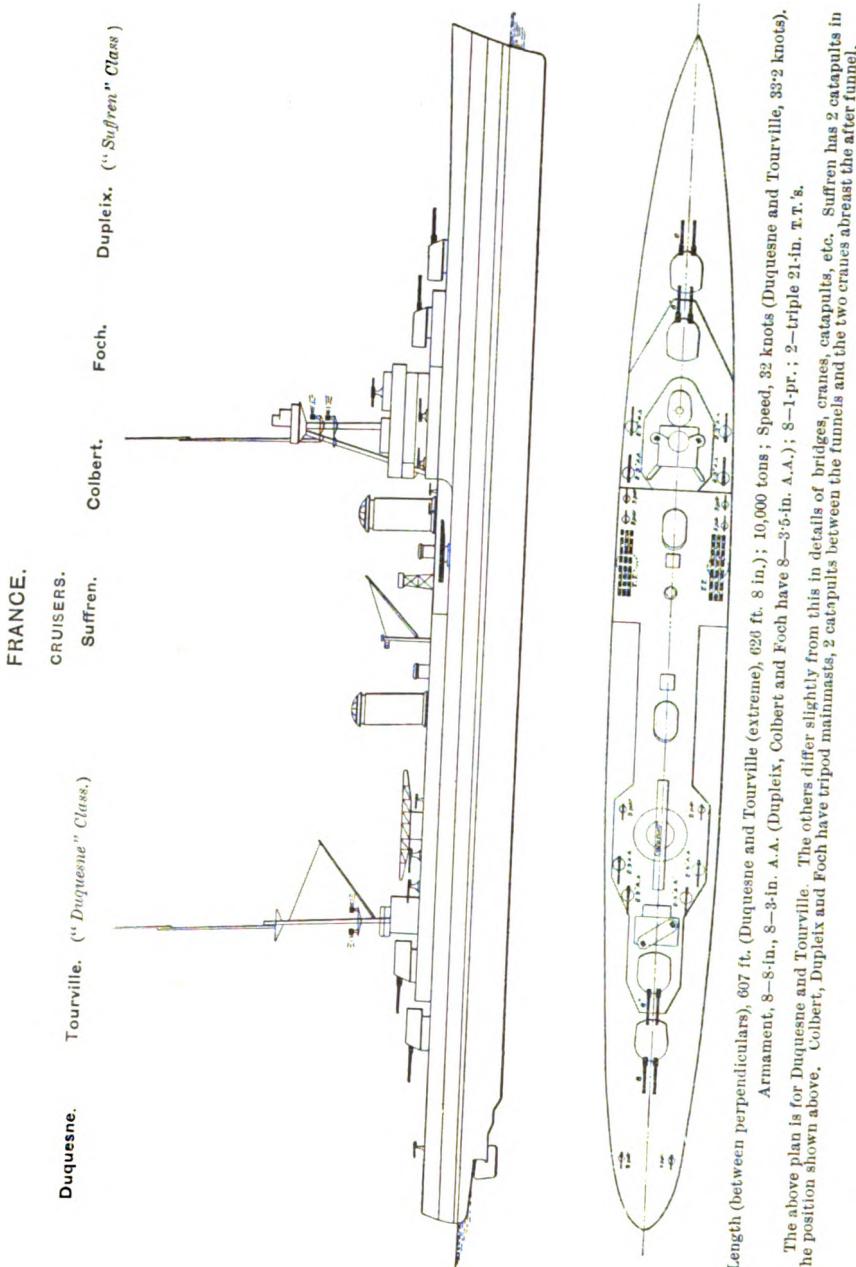
FRANCE.

ARMoured CRUISER

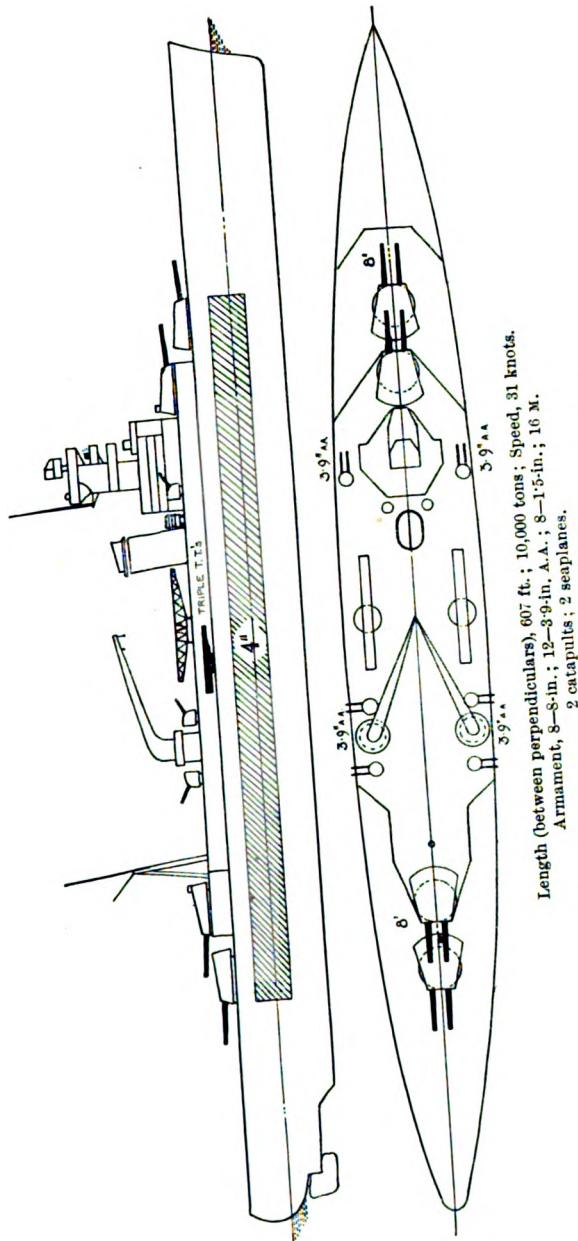
Waldeck Rousseau.



Length (extreme), 52 ft. 4 ins.; Length W.L., 51 ft.; Speed 23 knots; 12,617 tons; Completed, 1910. Armament, 14-7-6-in.; 10-3-in.; 10-9-pr. A.A.; 2-3 pr.; 2 M.; 2 submerged 18-in. torpedo tubes.



FRANCE.  
CRUISER.  
Algérie.



Length (between perpendiculars), 607 ft.; 10,000 tons; Speed, 31 knots.  
Armament, 8—8-in.; 12—3-in. A.A.; 8—1½-in.; 16 M.  
2 catapults; 2 seaplanes.

## FRANCE.

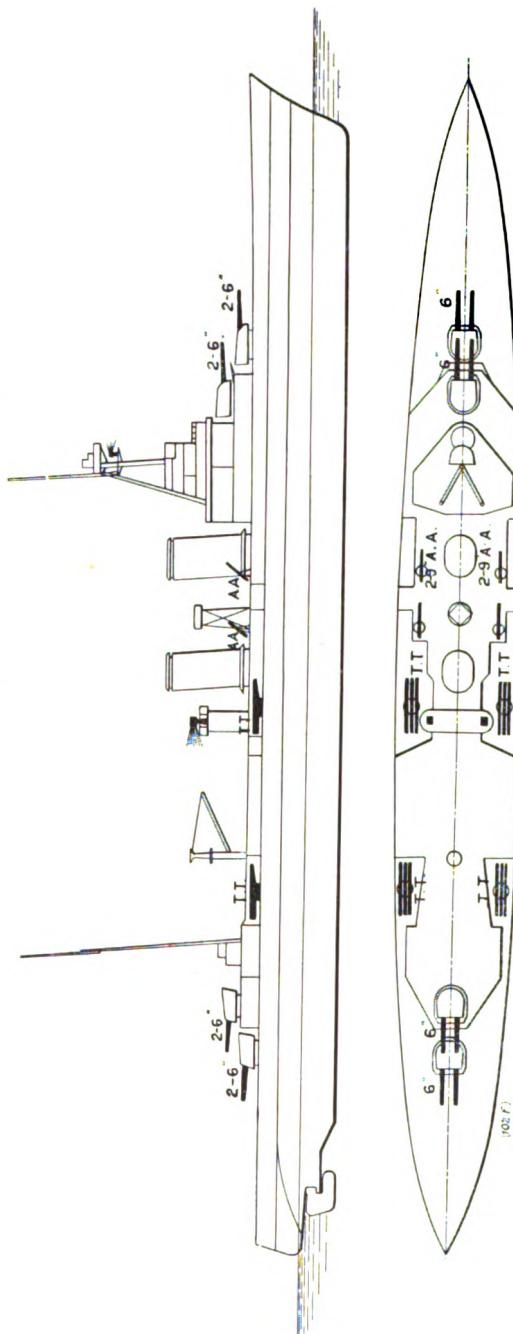
## CRUISERS.

*"Duguay-Trouin" Class.*

La Motte Picquet.

Primauguet.

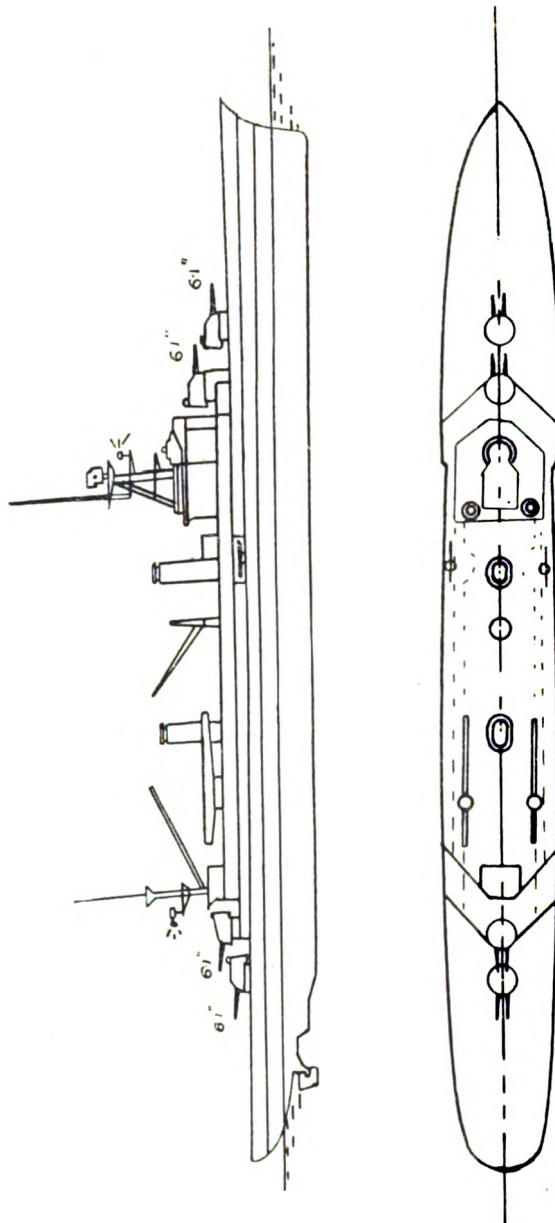
Duguay-Trouin.



Length (extreme), 594 ft. 10 ins.; Length B.P., 575 ft.; 7,249 tons; Speed, 33 knots. Completed, 1906-27.  
Armament, 8-6.1-in.; 4-3-in. A.A.; 2-3-pr.; 2 M.; 1 L.; 4 triple torpedo tubes (21.7-in. torpedoes); catapult; 2 seaplanes.

NOTE.—Reported to have protection to magazines.

FRANCE.

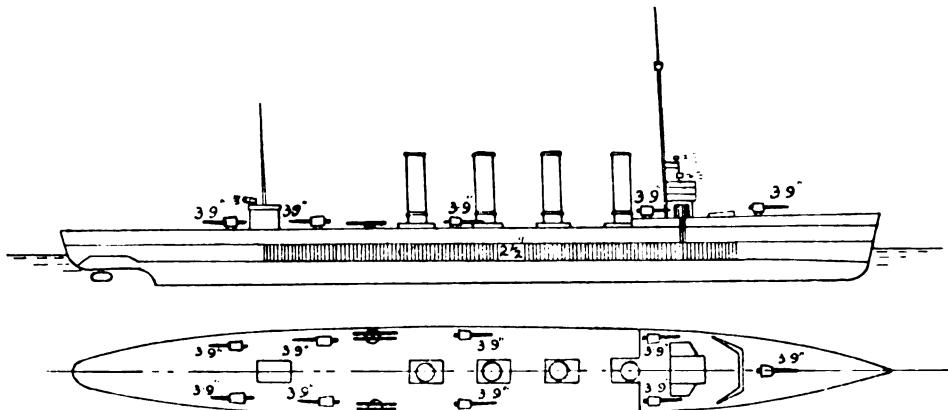
TRAINING CRUISER.  
Jeanne d'Arc.

Length (extreme), 557 ft. 8 ins.; 6,496 tons; Speed, 26 knots; Completed 1931.  
 Armament, 8—6-in.; 4—3-in. A.A.; 2—16-in.; 2 M.; 2—21.7-in. torpedo tubes.  
<sup>2</sup> Seaplanes.

Correction to plan : The catapults have been removed.

## FRANCE

## LIGHT CRUISER.

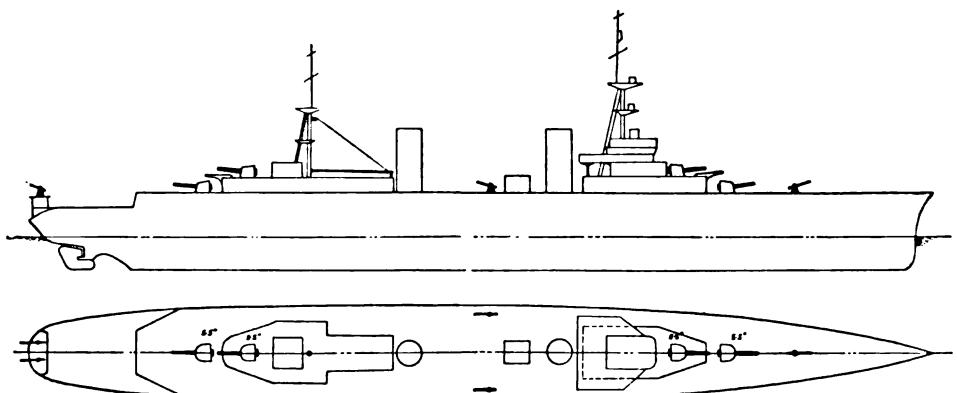
Thionville (*ex-Austrian Novara*).

Length (extreme), 428 ft. 7 ins.; 2,022 tons; Speed, 27 knots.  
 Armament, 9-3 9-in.; 2-3-in. A.A.; 2 twin above-water torpedo tubes.  
 Correction to plan: The torpedo tubes are fitted right aft.

## FRANCE.

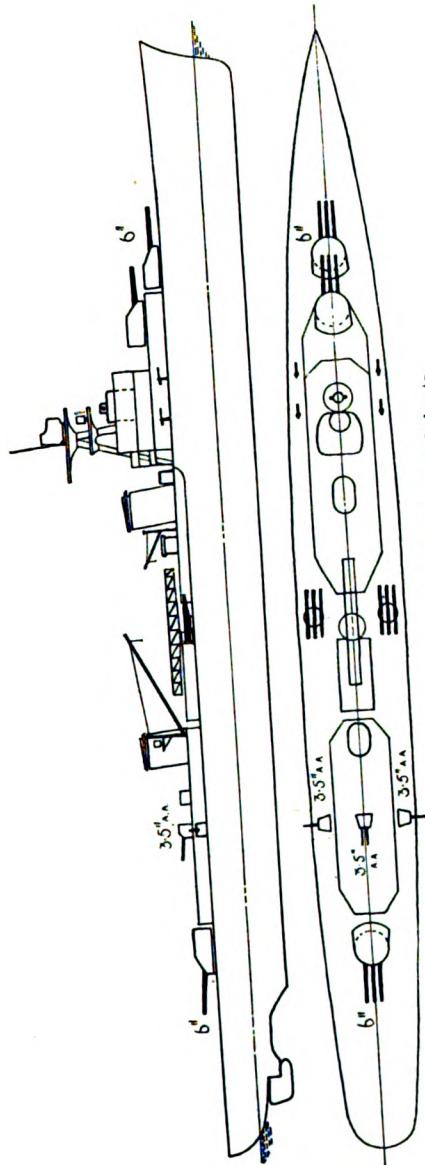
## CRUISER MINELAYER,

Pluton.



Length (between perpendiculars), 472 ft.; 4,773 tons; Speed, 30 knots; Completed, 1931.  
 Armament: 4-5.5-in., 10-1-pdr.; 12 M.; 1,000 mines.

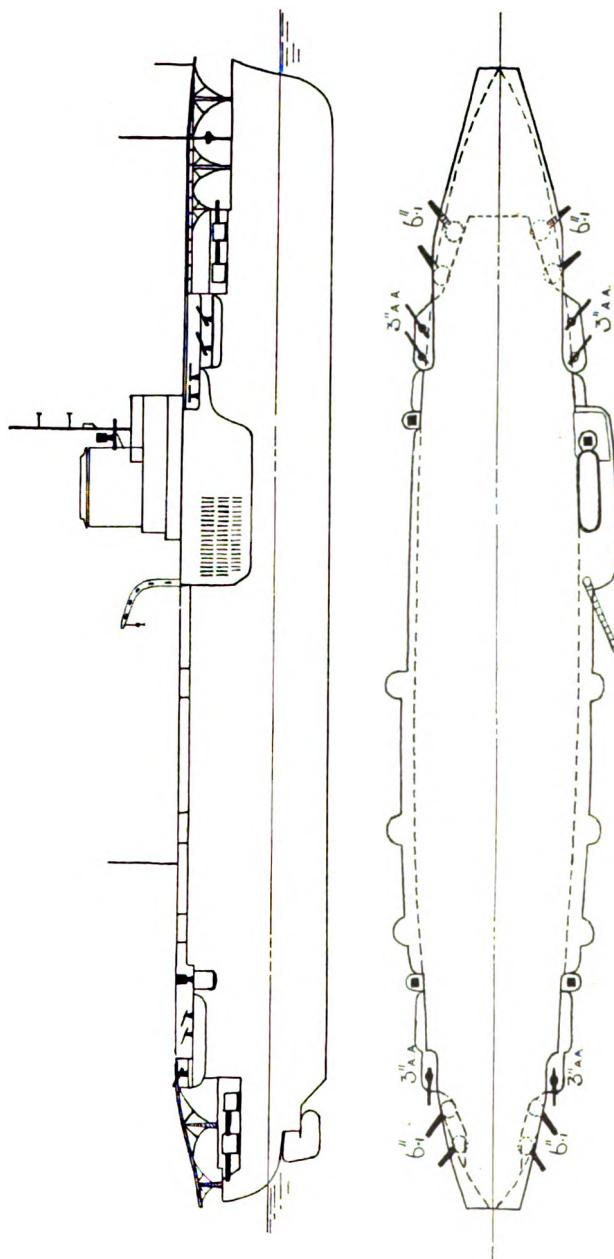
FRANCE.  
CRUISER MINELAYER.  
Emile Bertin.



Length (extreme), 580 ft.; 5,880 tons; Speed, 34 knots.  
Armament, 9—6-in.; 4—3.5-in. A.A.; 8—1-pr.; 250 mines.  
1 catapult; 1 aircraft.

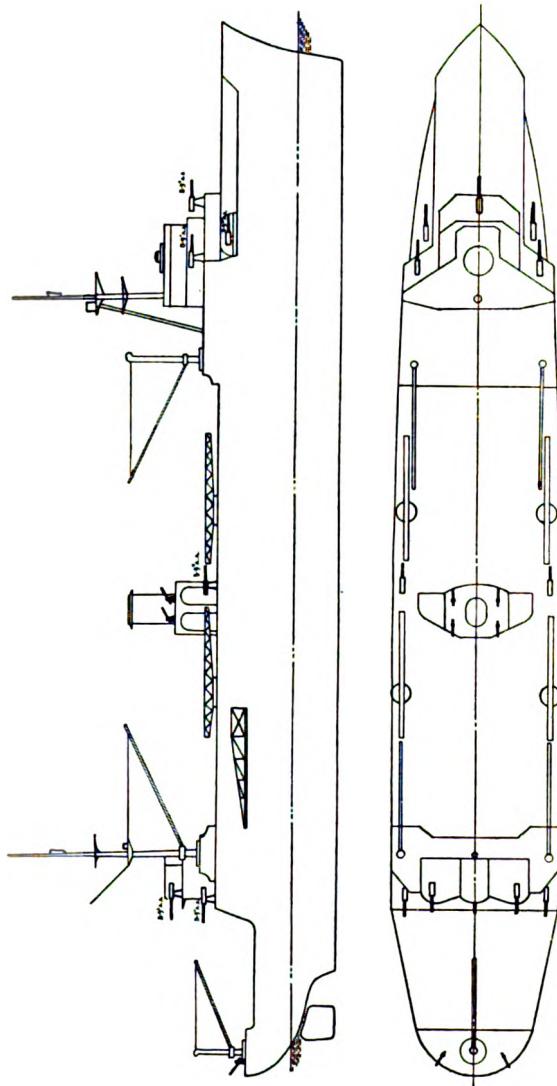
Building at Penhoet, St. Nazaire.

FRANCE.  
AIRCRAFT CARRIER.  
Béarn.



Length (extreme), 597 ft. ; 22,146 tons ; Speed, 21.5 knots ; Completed, 1928.  
Armament, 8-6-in.; 6-3-in.; 8-1-pr. A.A.; 8-12 M. A.A.; 4-21.7-in torpedo tubes; 41 planes.

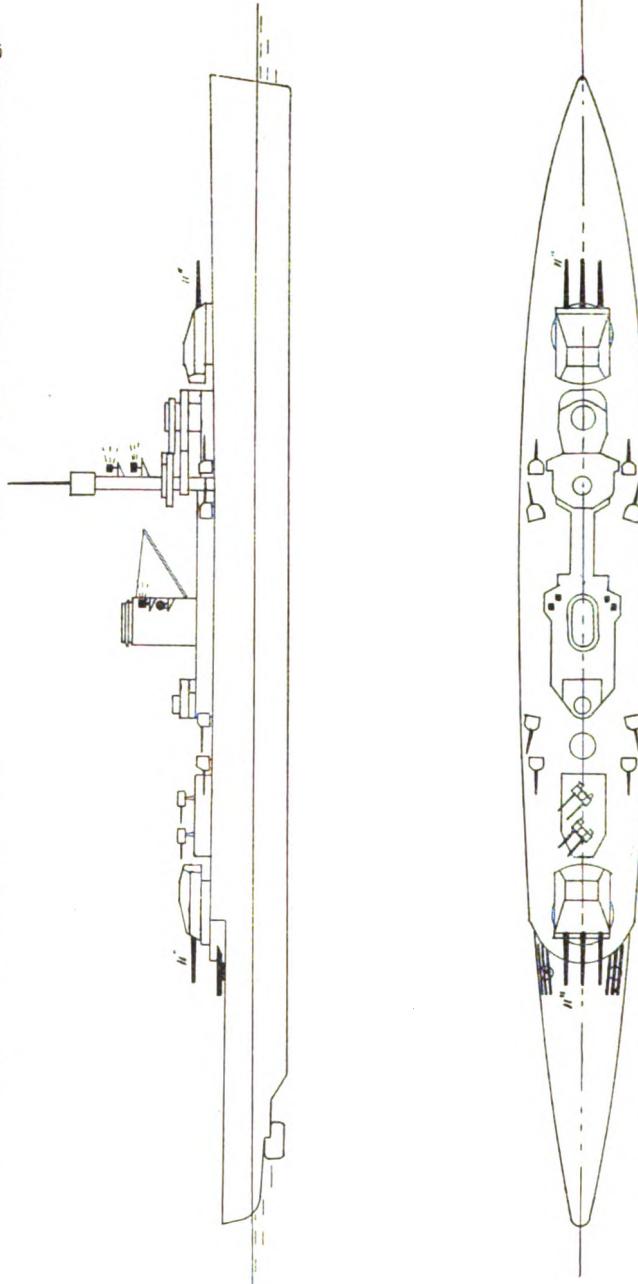
FRANCE.  
AVIATION TRANSPORT.  
Commandant Teste.



Length (extreme), 548 ft.; 10,000 tons; Speed, 20½ knots; Completed, 1932.  
Armament, 12—3½ in. A.A.; 8—3-pdr. A.A.; 12 M.; 20 planes.

## GERMANY.

## ARMoured SHIPS

Deutschland (*formerly known as Ersatz Preussen*).Admiral Scheer (*formerly known as Ersatz Lothringen*).Admiral Graf Spee (*formerly known as Ersatz Braunschweig*).

Length (extreme), 609 ft.; Standard Displacement, 10,000 tons; Speed, 26 knots. Deutschland completed, 1933. The others are building.  
 Armament, 6-11-in.; 8-5-in.; 4-3-4-in. A.A.; 6 torpedo tubes.

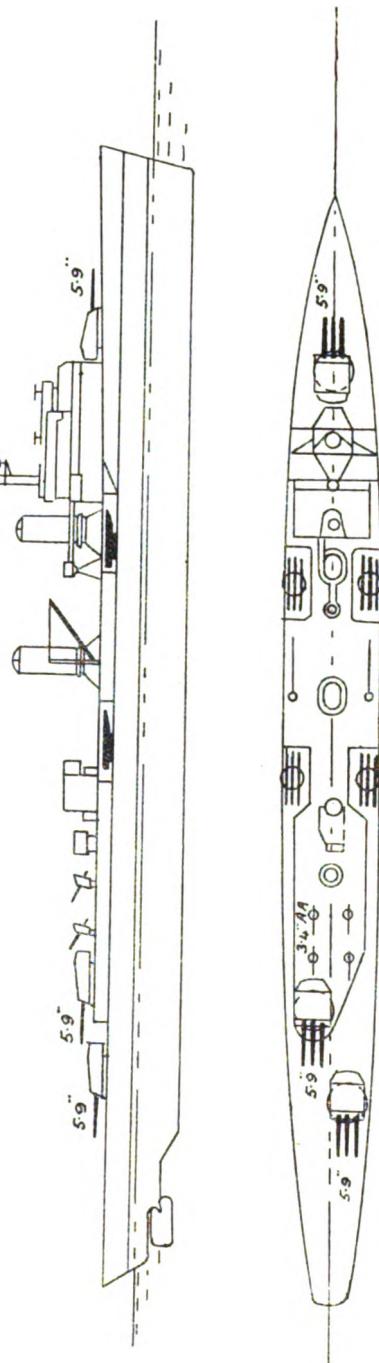
GERMANY.

LIGHT CRUISERS.

Königsberg.

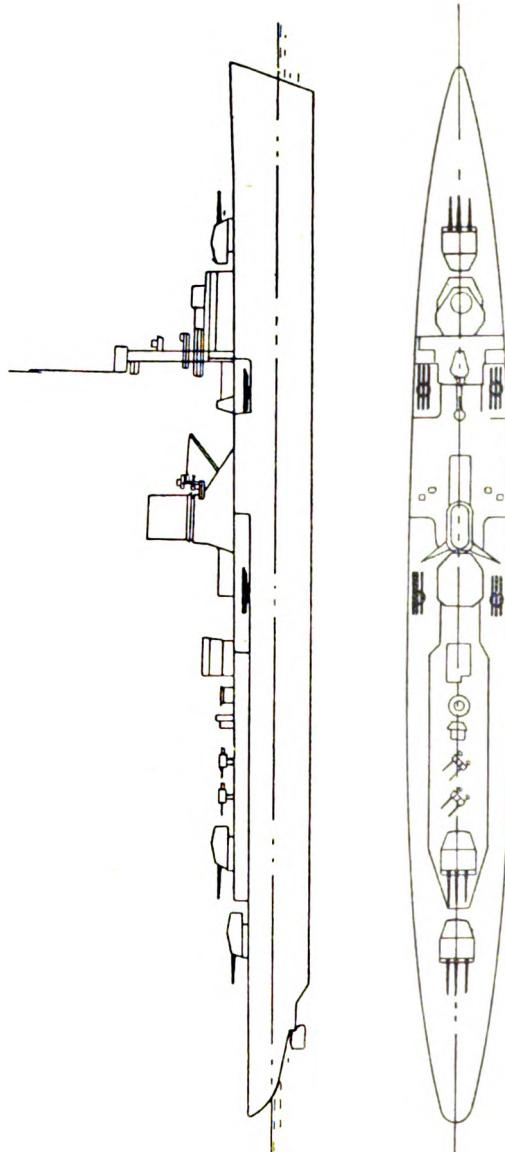
Karlsruhe.

Köln.



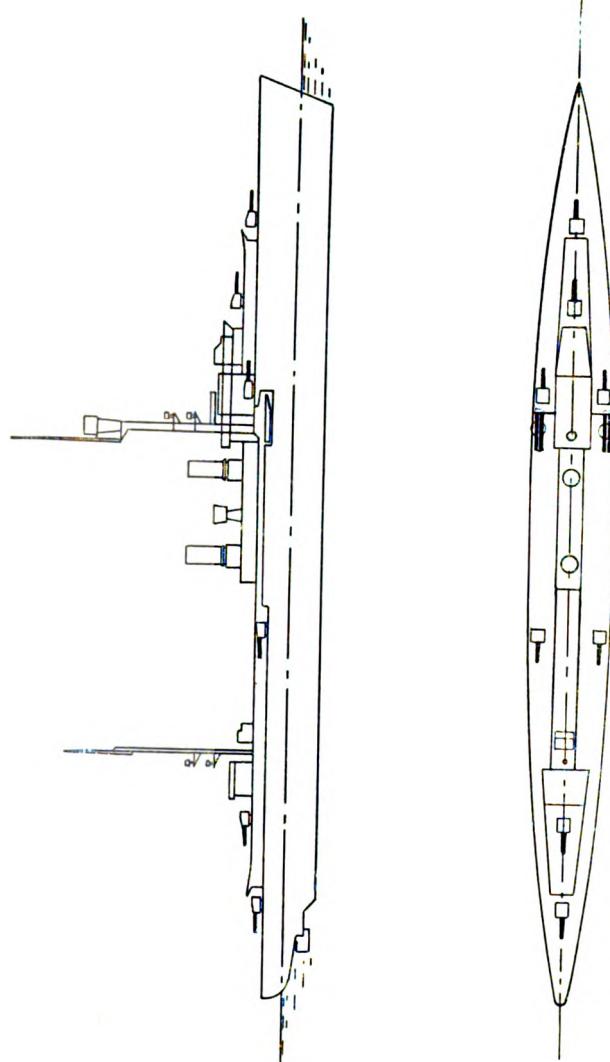
Length (extreme), 570 ft. 10 ins.; 6,000 tons; Speed, 32 knots; Completed, 1929-30.  
Armament, 9-5.9-in.; 4-3.4-in. A.A.; 4 triple 197-in. torpedo tubes.

GERMANY.  
LIGHT CRUISER,  
Leipzig



Length W.L., 543 ft. 10 ins.; 6,000 tons; Speed 32 knots; Completed, 1931.  
Armament, 9—5.9 in.; 4—3.4 in. A.A.; 4 triple 19.7-in. torpedo tubes.

GERMANY.

LIGHT CRUISER.  
Emden.

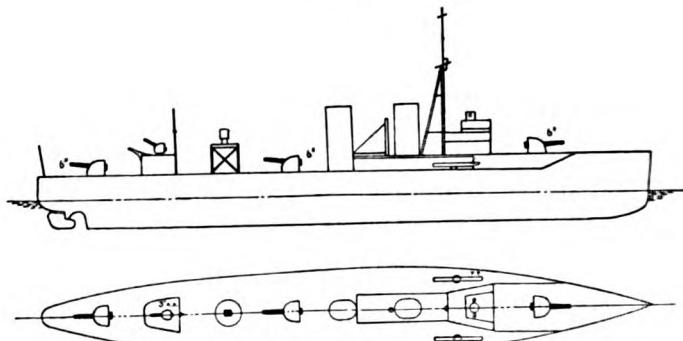
Length (extreme), 510 ft. 2 ins.; 6,000 tons; Speed, 20 knots; Completed, 1925.  
Armament, 8-5-in. guns will be mounted in twin mountings, 2-3-4-in. A.A.; 4-197-in. torpedo tubes in twin mountings.

The 8-5-in. guns will be mounted in twin mountings, 2 forward and 2 aft, when the mountings are ready.  
Correction to plan: The forward funnel is higher than the after one.

GREECE.

CRUISER

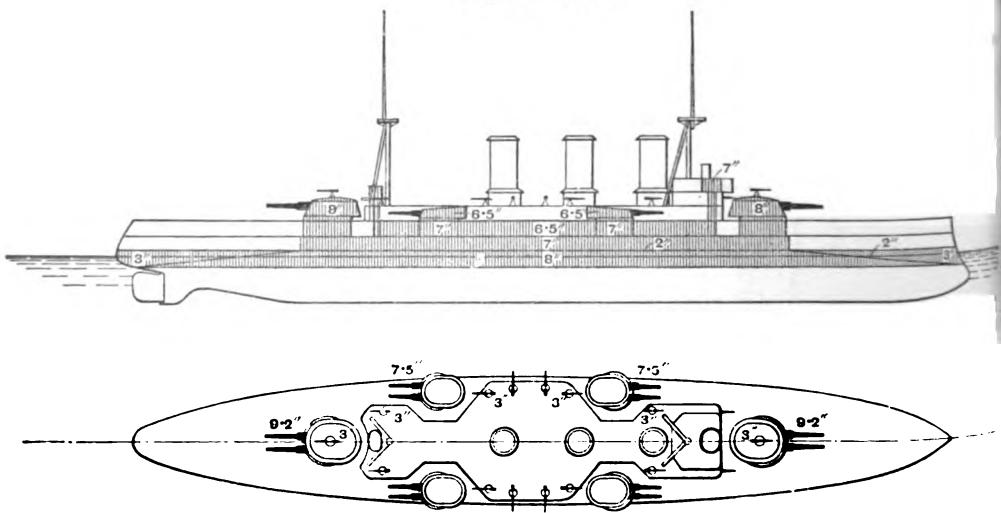
Helle.



Length, 322 ft. ; 2,083 tons ; Speed, 20 knots ; Completed, 1914 ; Reconstructed, 1929.  
Armament, 3—6-in.; 1—3-in. A.A.; 110 mines; 2—18-in. torpedo tubes.

ARMoured CRUISER.

Giorgios Averoff.



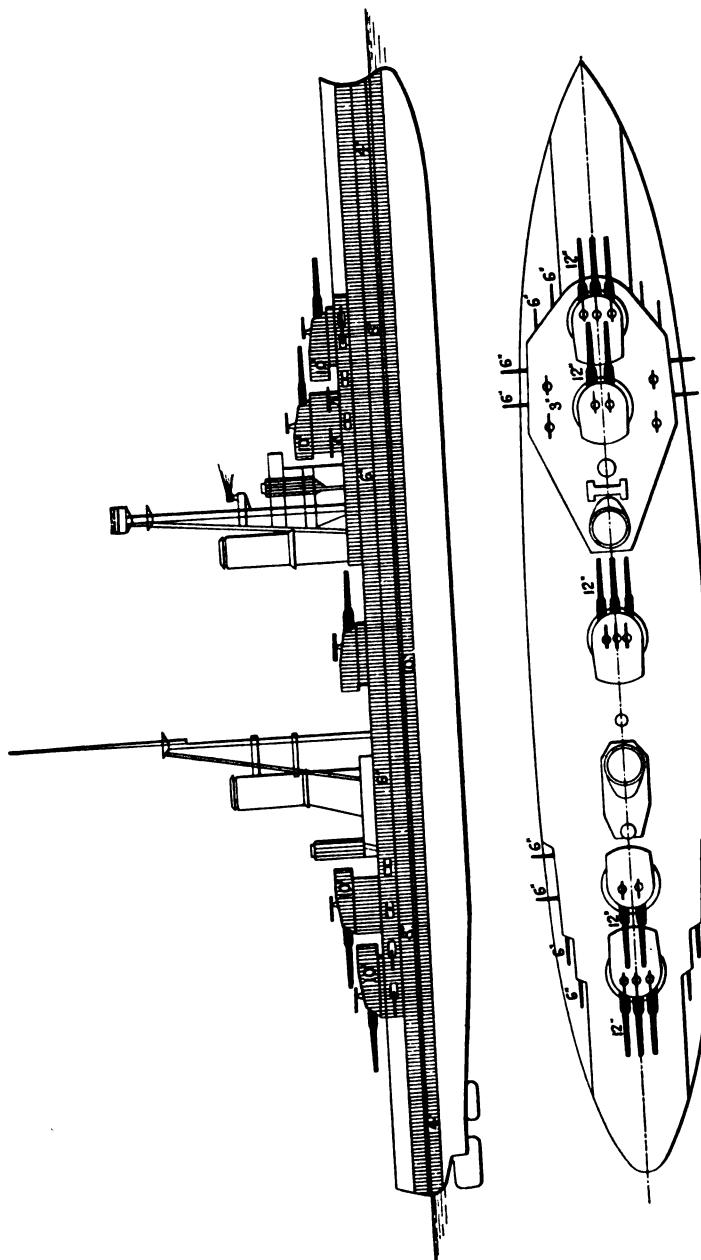
Length, 462 ft. ; 9,301 tons ; Speed, 24 knots ; Completed, 1911. Refitted, 1927.  
Armament, 4—9·2-in.; 8—7·5-in.; 16—3-in.; 2—3-in. A.A.; 4—5-pr.; 2 M. ; 3 submerged 18-in. torpedo tubes

ITALY.

## BATTLESHIPS.

Andrea Doria.

Caio Duilio.



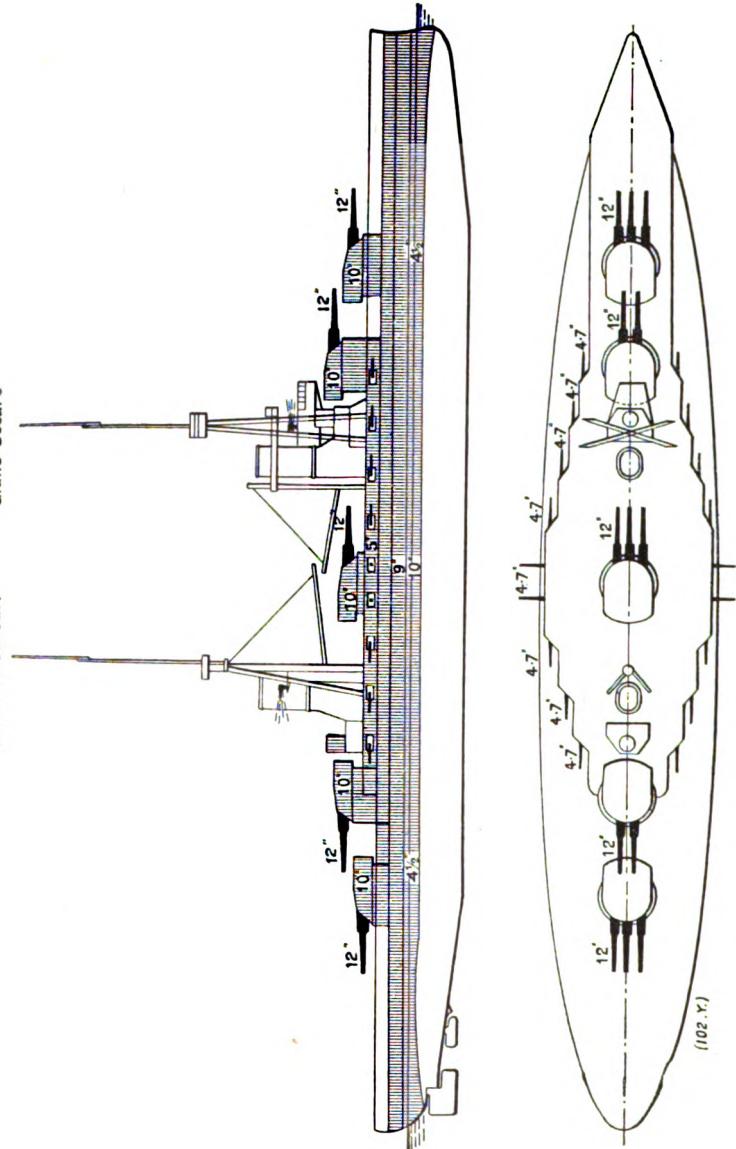
(8/07/0) Length (extreme), 575 ft. 9 ins.; Length B.P., 555 ft. 4 ins.; Speed, 22 knots; Completed, 1916.  
 Armament, 13-12-in.; 16-6-in.; 13-3-in. (3 of these are temporarily removed); 6-3-in. A.A.; 2-2-pr.; 6 M.; 4 L.; 2-18-in. torpedo tubes.

## ITALY.

## BATTLESHIPS.

Conte di Cavour.

Giulio Cesare



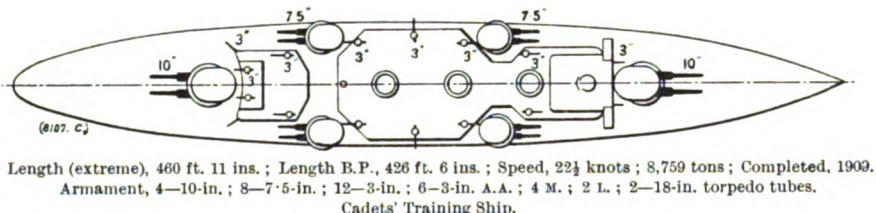
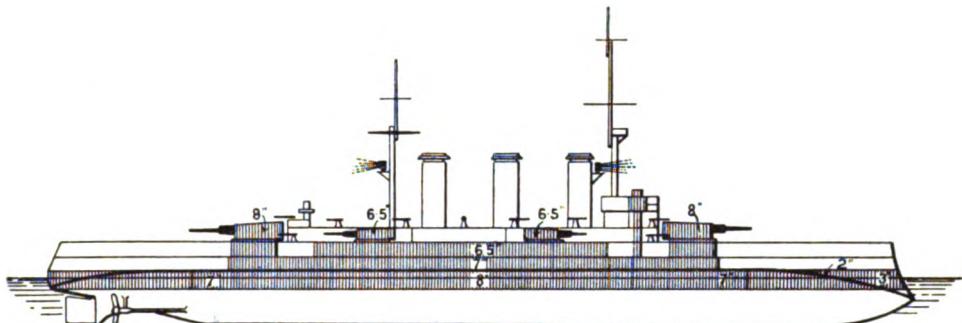
Length (extreme), 577 ft. 4 ins. ; Length B.P., 554 ft. 4 ins. ; Speed, 22 knots; 22,144 tons ; Completed, 1914-1915.  
Armament, 13-12-in.; 18-4.7-in.; 18-3-in. (3 of these are temporarily removed); 6-3-in. A.A.; 2-2-pr.; 2 M.; 4 L.  
A fixed catapult is mounted on port side of Forecastle Deck forward.  
(1921)

( P67 )

ITALY.

ARMoured CRUISER \*

Pisa.

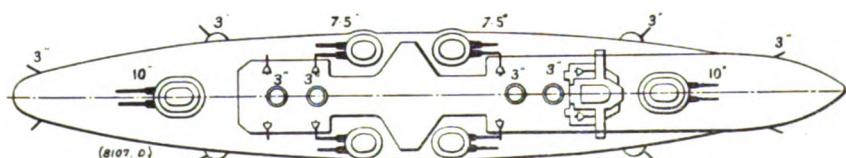
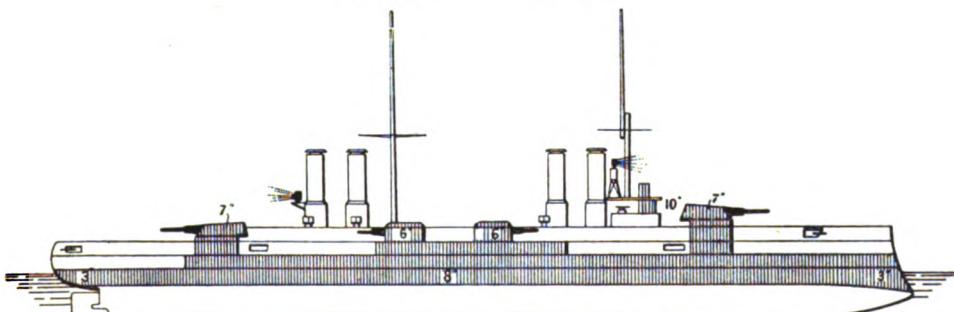


Length (extreme), 460 ft. 11 ins.; Length B.P., 426 ft. 6 ins.; Speed, 22½ knots; 8,759 tons; Completed, 1909.  
Armament, 4—10-in.; 8—7.5-in.; 12—3-in.; 6—3-in. A.A.; 4 M.; 2 L.; 2—18-in. torpedo tubes.  
Cadets' Training Ship.

ARMoured CRUISERS \*

S. Giorgio.

S. Marco.



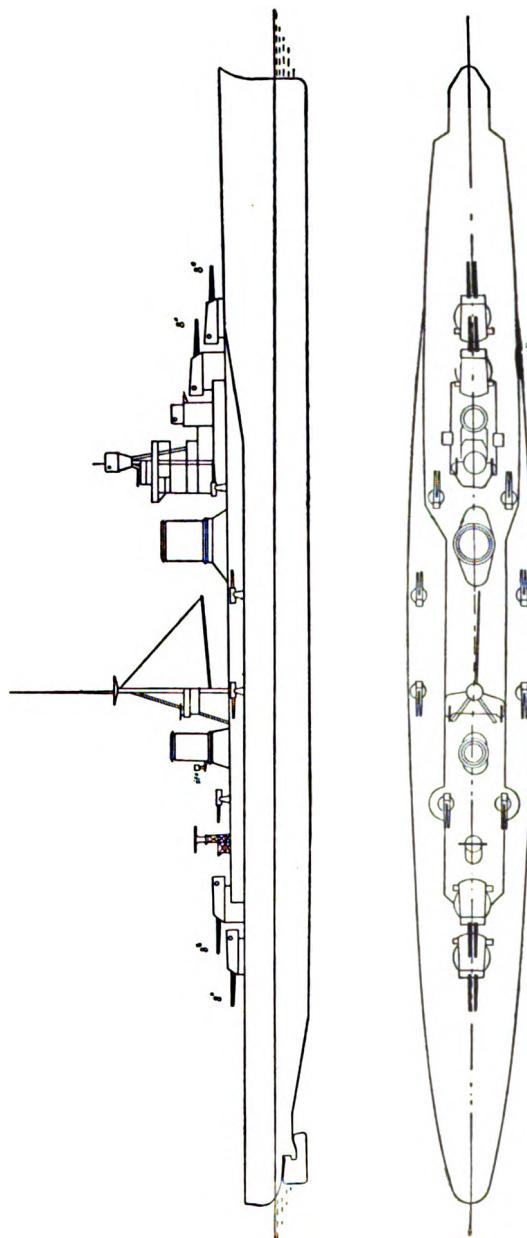
Length (extreme), 462 ft. 2 ins.; Length B.P., 429 ft. 10 ins.;  
Speed, 22.5 and 23 knots; 9,232 and 9,350 tons; Completed, 1910 and 1911.  
Armament, 4—10-in.; 8—7.5-in.; 10—3-in.; 6—3-in. A.A.; 2—3-pr.; 6 M.; 2 L.; 2—18-in. torpedo tubes.  
\* Classified as Battleships, 2nd class, in Italian official tests.

ITALY.

CRUISER.

*Modified "Trento" Class.*

Bolzano.



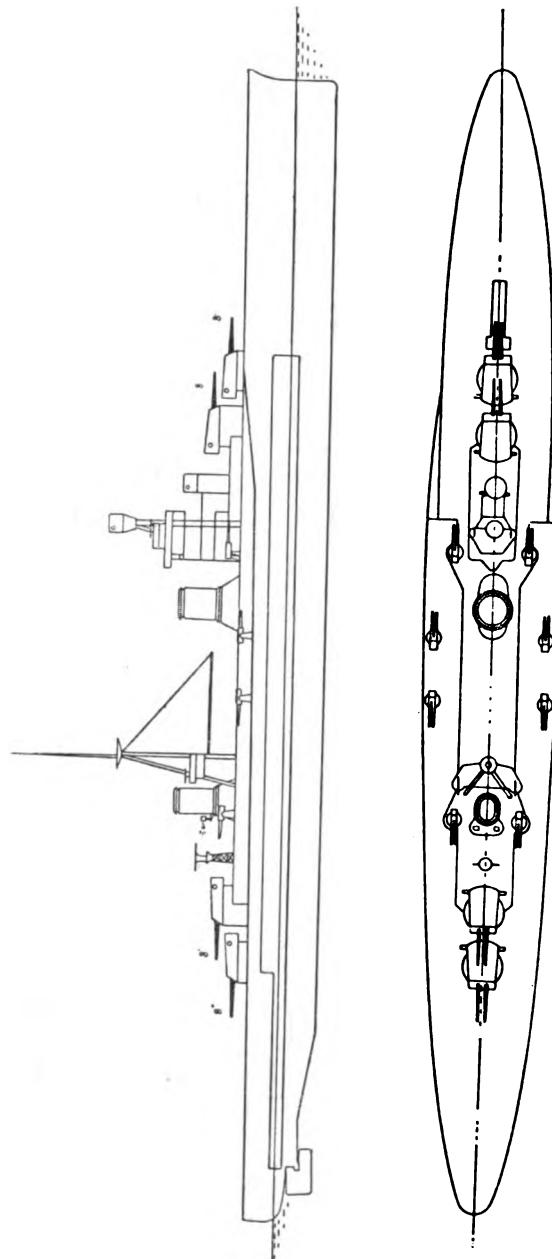
Length B.P., 644 ft.; 10,000 tons; Completed, 1932.  
Armament, 8—8-in.; 10—3-in. A.A.; 12 smaller; 2 catapults.  
8—21-in. torpedo tubes may be fitted.

## ITALY.

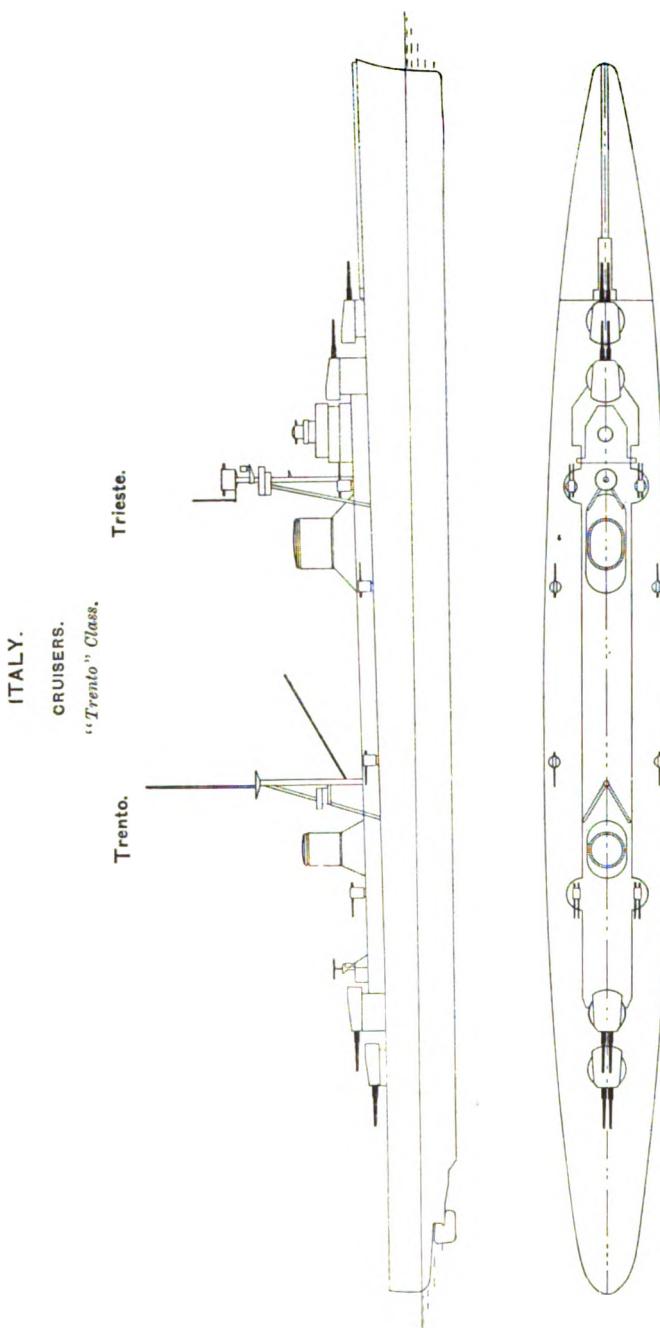
## CRUISERS.

*"Zara" Class.*

Pola.	Zara.	Flume.	Gorizia.
-------	-------	--------	----------



Length : Zara and Flume, 599 ft. 5 ins.; Pola, 600 ft.; Gorizia, 590 ft. 9 ins.; 10,000 tons; Speed, 32 knots.  
 Armament, 8—8-in.; 16—39-in.; 1 catapult; 2 aircraft.  
 1 smaller.



Length (extreme), 646 ft. 2 ins.; 10,000 tons; Speed, 35 knots; Completed, 1929.  
Armament, 8—8-in.; 16—3-9-in.; 4—L Fdr.; 8 M.G.; 4 twin torpedo tubes.  
1 catapult; 2 aircraft.

Correction to plan : The 4-in. guns between the funnels are twin guns.

## ITALY.

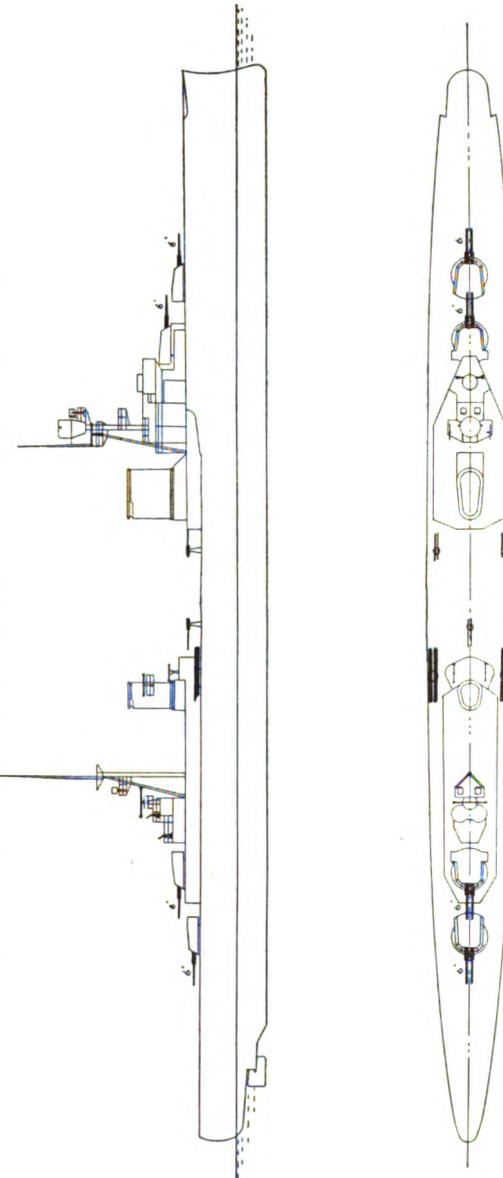
Note.—The Monteucolli and Muzio Attendolo (building) are also of this class, but the arrangements may differ from those shown in the plan.

## CRUISERS.

"Condottieri" Class.

Bartolomeo Colleoni,  
Giovanni della Bande Nere.

Armando Diaz.\*  
Luigi Cadorna.\*



Length (extreme), 556 ft., 5 ins.; 5,069 tons (\*559 ft., 5,000 tons); Speed, 37 knots; Completed, 1931-33.  
Armament, 8-6-in.; 6-3-in. A.A.; and smaller guns; 4 torpedo tubes.  
1 catapult and 2 seaplanes.

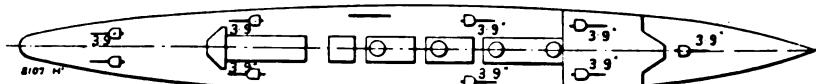
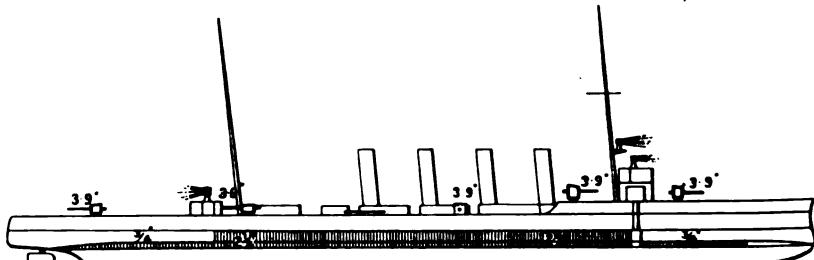
Corrections to plan: The bridge and foremast have been modified. The after twin 3-in. A.A. gun is at the superstructure level on a raised platform.  
\* In the Armando Diaz and Luigi Cadorna the mainmast is forward of the after funnel, the torpedo tubes are abreast the forward funnel, and the positions of the twin A.A. guns are reversed, the foremost gun being at forecastle deck level and the two after guns at upper deck level.

## ITALY.

## LIGHT CRUISERS.\*

Venezia (ex-Austrian Saida).

Brindisi (ex-Austrian Heligoland).

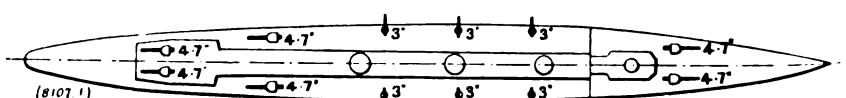
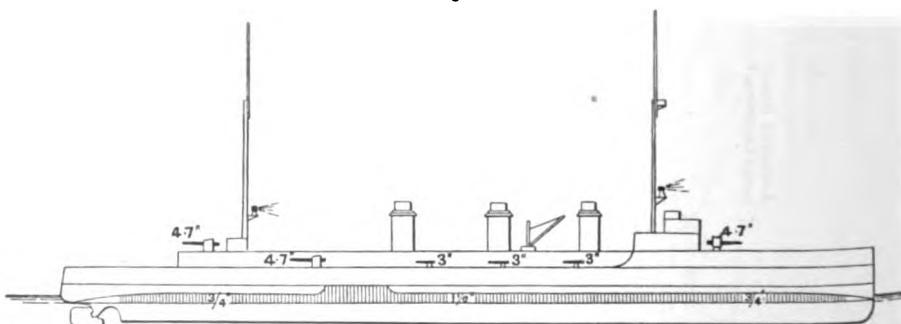


Length (extreme), 430 ft.; Length W.L., 416 ft. 9 ins.; Speed, 27 knots; 2,756 tons; Completed, 1914.  
Armament, 9—3.9-in.; 1—3-in. A.A.; 170 mines; 4 torpedo tubes.

NOTE.—Thionville (ex-Austrian Novara), sister ship, allocated to France.

## LIGHT CRUISER.\*

Quarto.



Length (extreme), 431 ft. 9 ins.; Length B.P., 413 ft. 5 ins.; Speed, 28 knots; 2,903 tons; Completed, 1911.  
Armament, 6—4.7-in.; 6—3-in.; 2—2-pr. A.A.; 2 above-water 18-in. torpedo tubes; 126 mines.

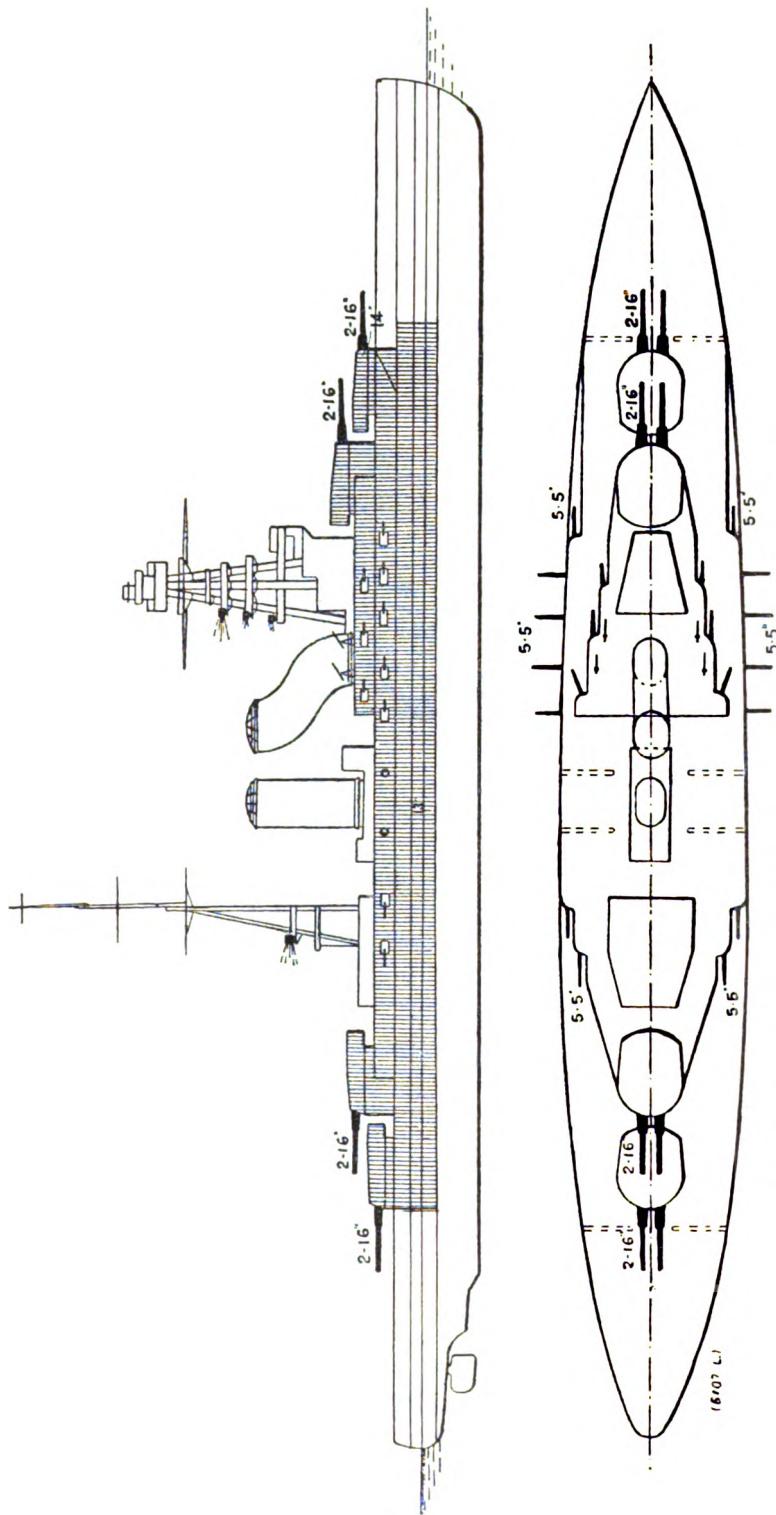
\* Classified as Scouts in Italian official tests.

JAPAN.

BATTLESHIPS.

"Nagato" Class.

Nagato. Mutsu.



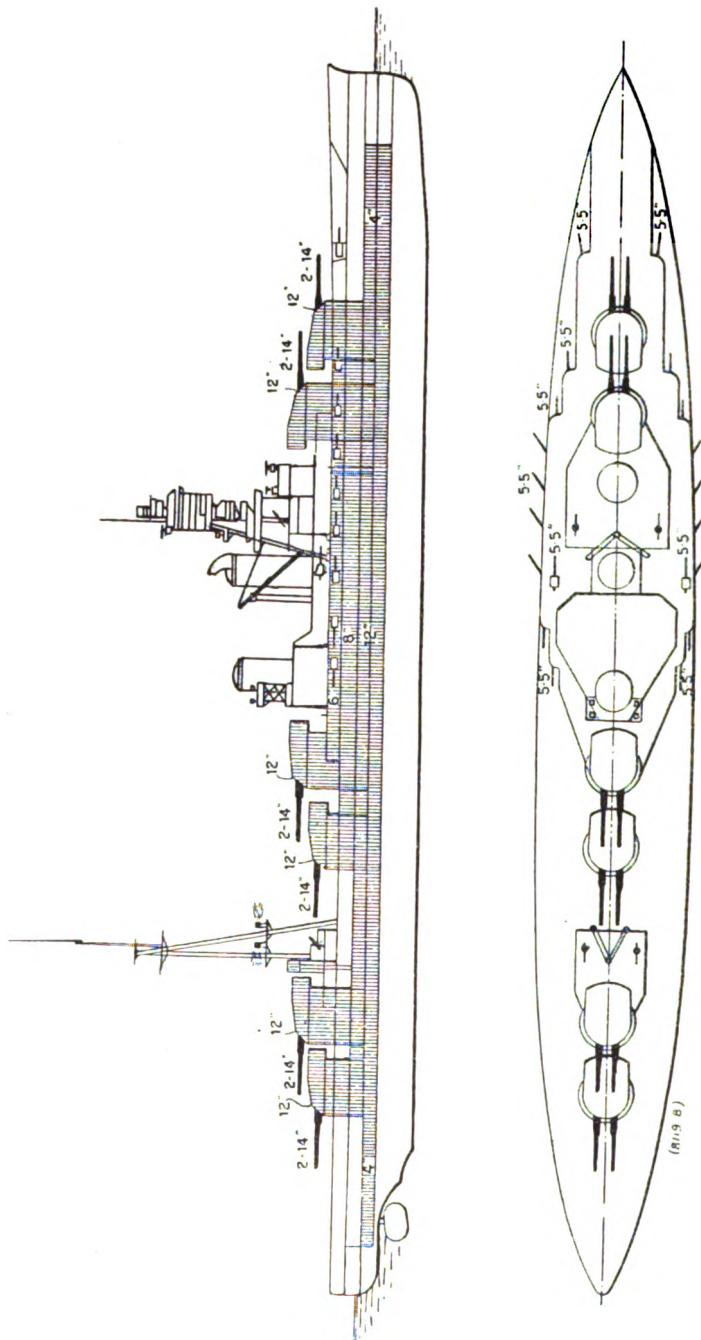
Length (extreme) 700 ft.; Length B.P. 660 ft. 7 ins.; Speed, 23 knots; 38,720 tons; Completed, 1920-1921.  
Armament, 8—20-in.; 20—5-in.; 4—5-in. A.A.; 4 above-water and 4 submerged 21-in. torpedo tubes.

JAPAN.

BATTLESHIPS.

"Fuso" Class.

Hyuga.  
Ise.

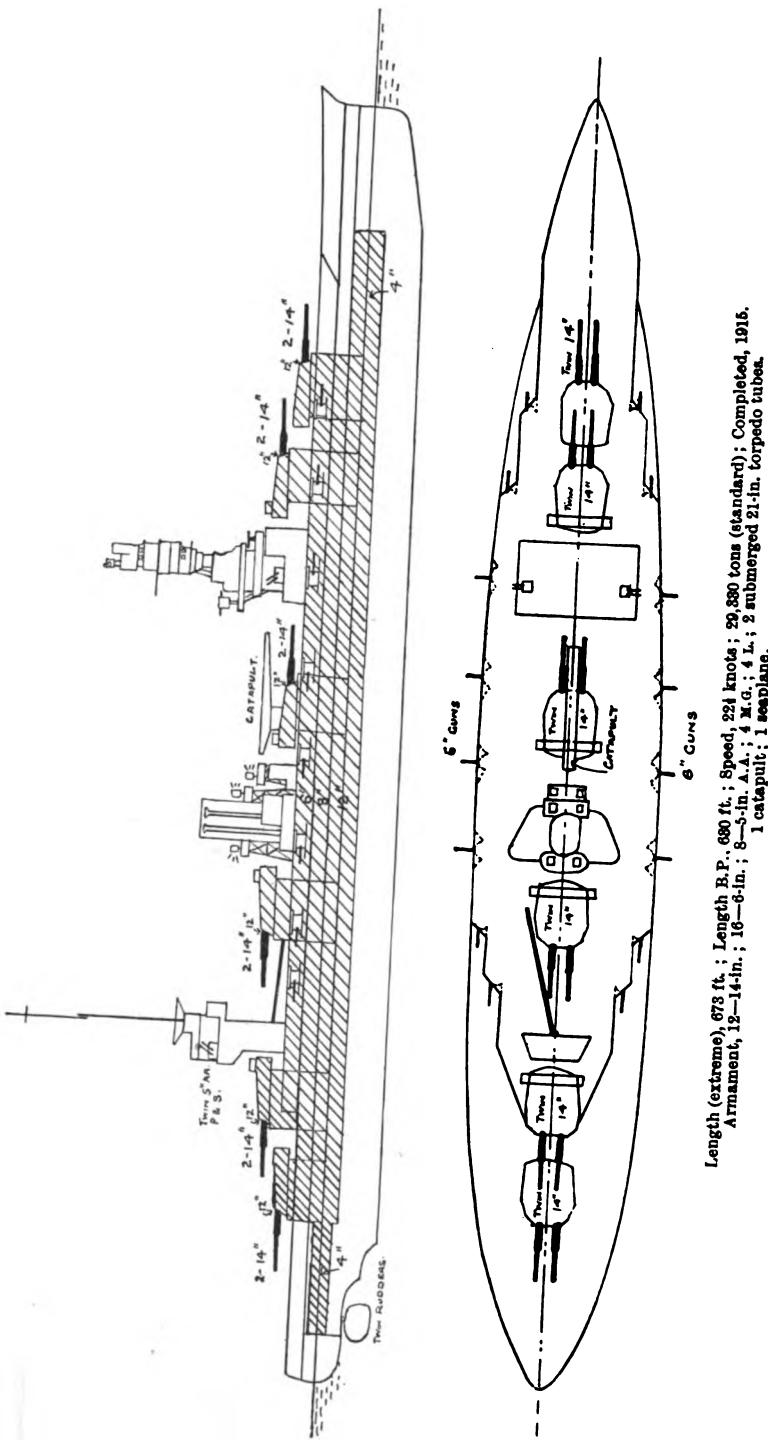


Length (extreme), 683 ft.; Length B.P., 640 ft.; Speed, 23 knots; 29,900 tons; Completed, 1917-18.  
 Armament, 12—14-in.; 20—6-5-in., 4—3-in. A.A., 6 submerged 21-in. torpedo tubes,  
 2 seaplanes.

JAPAN.

BATTLESHIP.

**Fuzo.** "Fuzo" Class. Yamashiro. (After reconstruction, 1934.)



**Length (extreme),** 673 ft.; **Length B.P.**, 680 ft.; **Speed**, 22 knots; **Standard Displacement**, 29,380 tons (standard); **Completed**, 1915.  
**Armament**, 12-14-in., 16-6-in.; 8-12-in. A.A.; 4 M.G.; 1 catapult; 1 seaplane; 2 submerged 21-in. torpedo tubes.

## JAPAN.

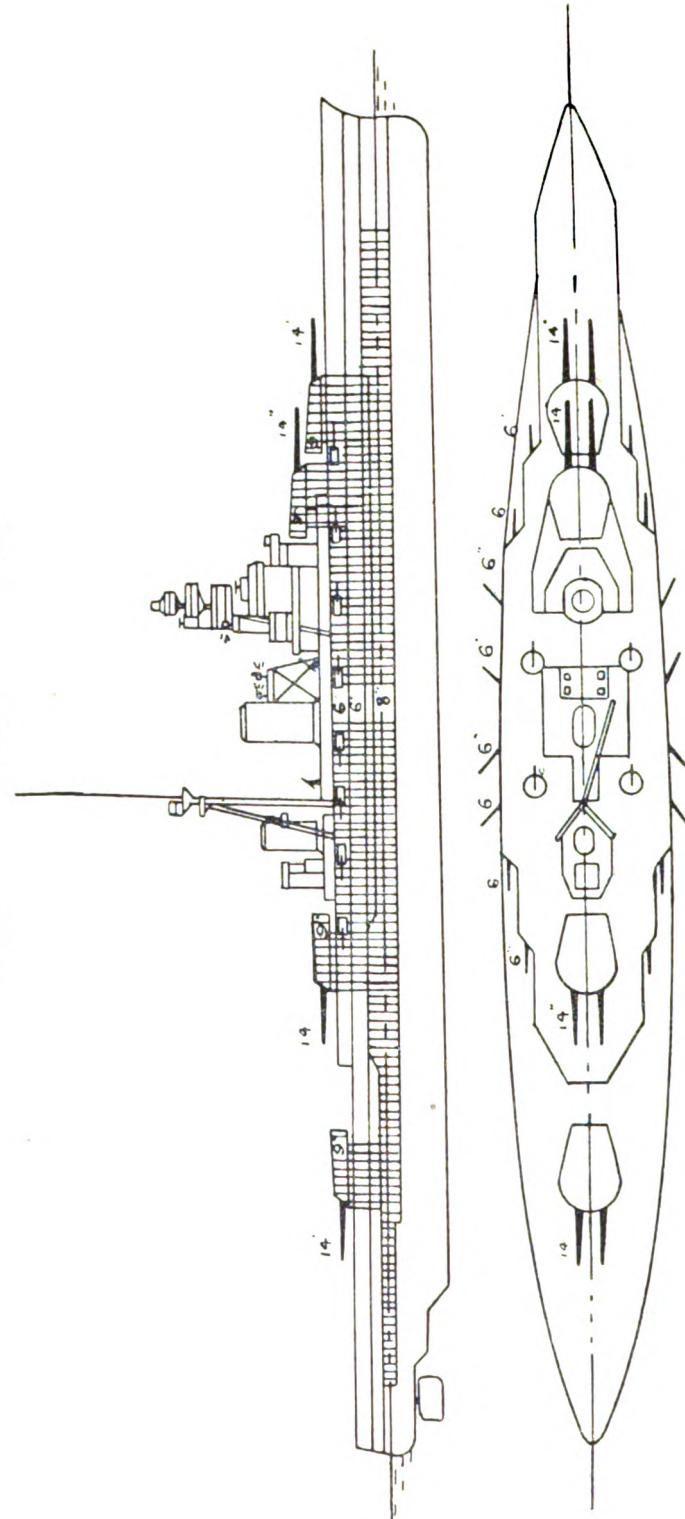
## BATTLESHIPS.

*"Kongō" Class.*

Kirishima.

Kongō.

Haruna.



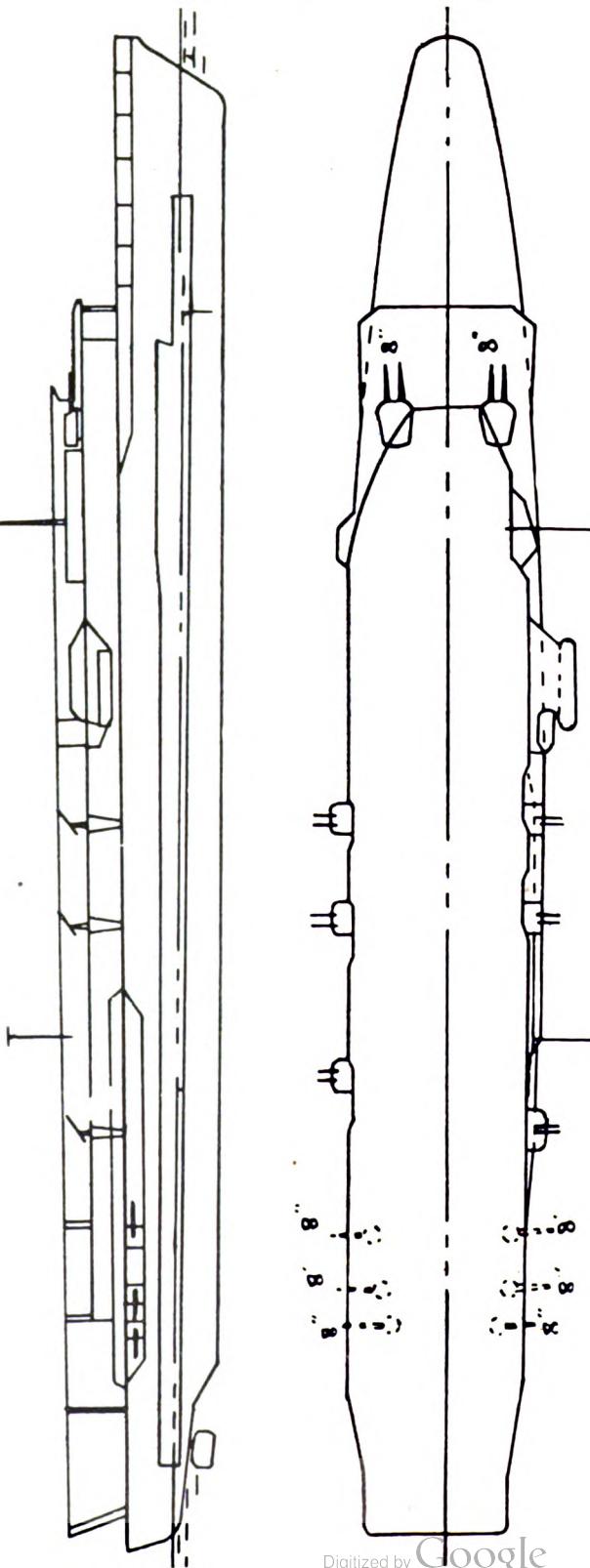
Length (extreme), 704 ft.; Speed, 26 knots; 29,330 tons; Completed, 1914-15; Modernised 1928-31.  
Armament, 8—14-in.; 16—6-in.; 4—3-in. A.A.; 4 submerged 21-in. torpedo tubes.

Hiyō of this class has been converted to a Training ship in accordance with the London Naval Treaty.

JAPAN.

AIRCRAFT CARRIER.

Akagi.



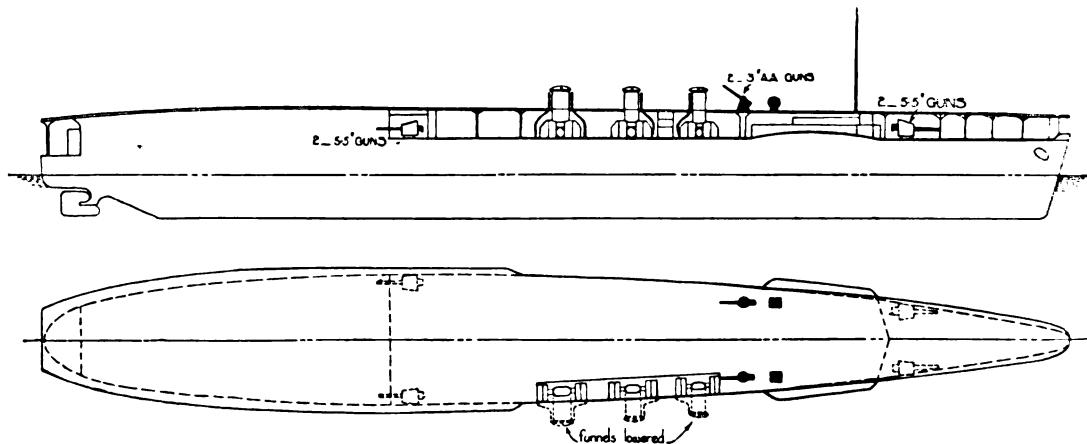
Length (between perpendiculars), 763 ft.; 26,900 tons; Speed, 25.5 knots; Completed, 1927.  
Armament, 12-4.7-in.; 12-8-in. A.A. Accommodation for 50 planes.

( P78 )

JAPAN.

AIRCRAFT CARRIER.

Hosho

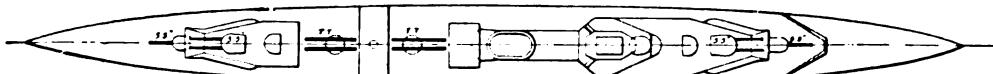
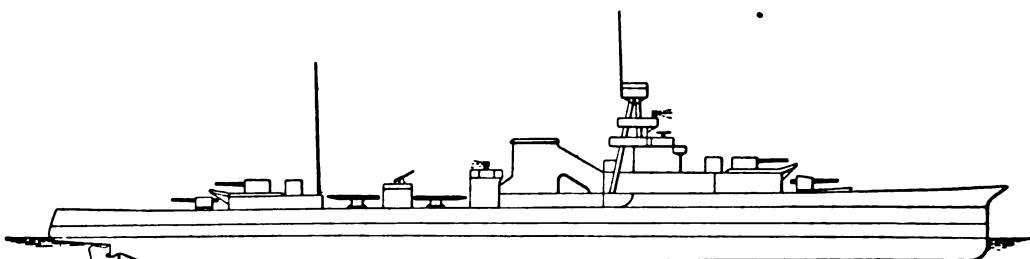


Displacement, 7,470 tons; Length B.P., 510 ft.; Speed, 25 knots; Completed, 1922.  
Armament, 4—5·5-in.; 2—3-in. A.A.; Carries about 28 planes; Fitted with gyro-stabiliser.

JAPAN.

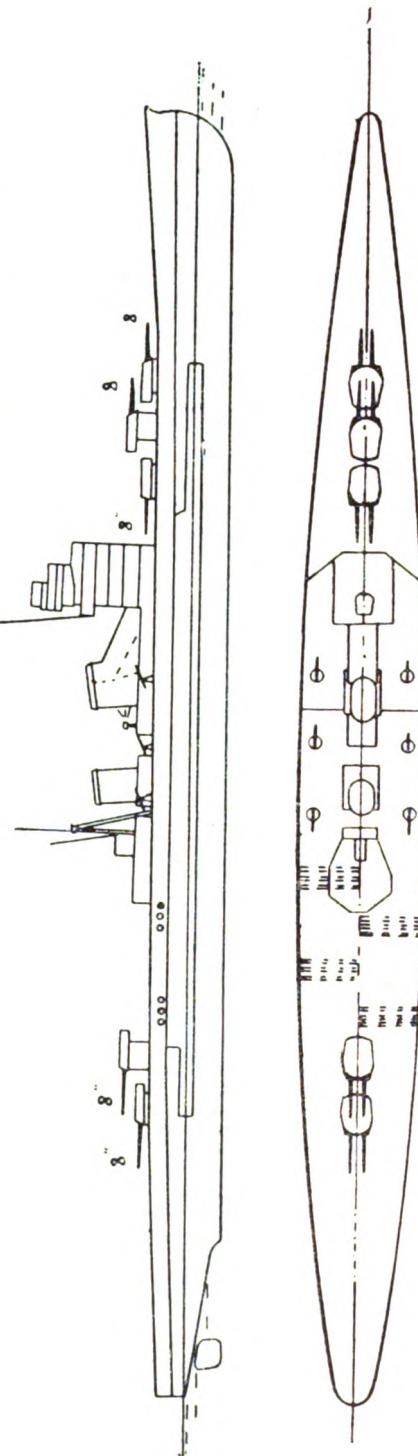
LIGHT CRUISER.

Yubari



Length (extreme), 465 ft.; Length B.P., 435 ft.; 2,890 tons; Speed, 33 knots. Completed, 1923.  
Armament, 6—5·5-in.; 1—3-in. A.A.; 2 M; 2 twin 21-in. torpedo tubes; 34 mines.

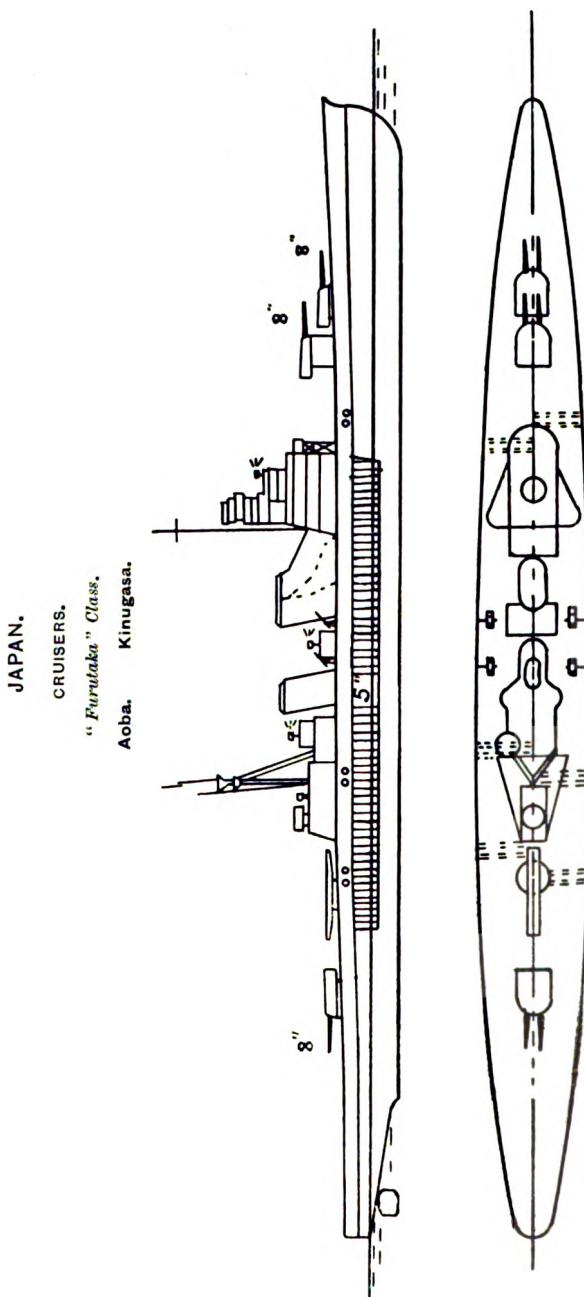
JAPAN.  
CRUISERS.  
Nachi, Myoko, Ashigara, Haguro. ("Nachi" Class.)  
Atago.\* Takao.\* Chokai.\* Maya.\* ("Takao" Class.)



Length (between perps.), 630 ft.; "Nachi" Class, 10,000 tons; "Takao" Class, 9,350 tons; speed, 33 knots.  
Armament, 10—8-in.; 0—4.7-in. A.A.; 0—12—21-in. torpedo tubes.

\* These have 4—4.7-in. A.A., and 8—21-in. torpedo tubes.

Corrections to plan: In the "Takao" class the after funnel is vertical, and the torpedo tubes are beneath the funnels on a deck higher. In the "Nachi" Class the foremost pair of 4.7-in. A.A. guns are a deck higher.



Length (extreme), 695 ft.; 7,100 tons; Speed, 33 knots.  
Armament, 6-8-in.; 4-4.7-in. A.A.; 12-21-in. torpedo tubes.  
1 catapult; 2 aircraft.

Correction to plan : The tops of the funnels are square to the funnels.

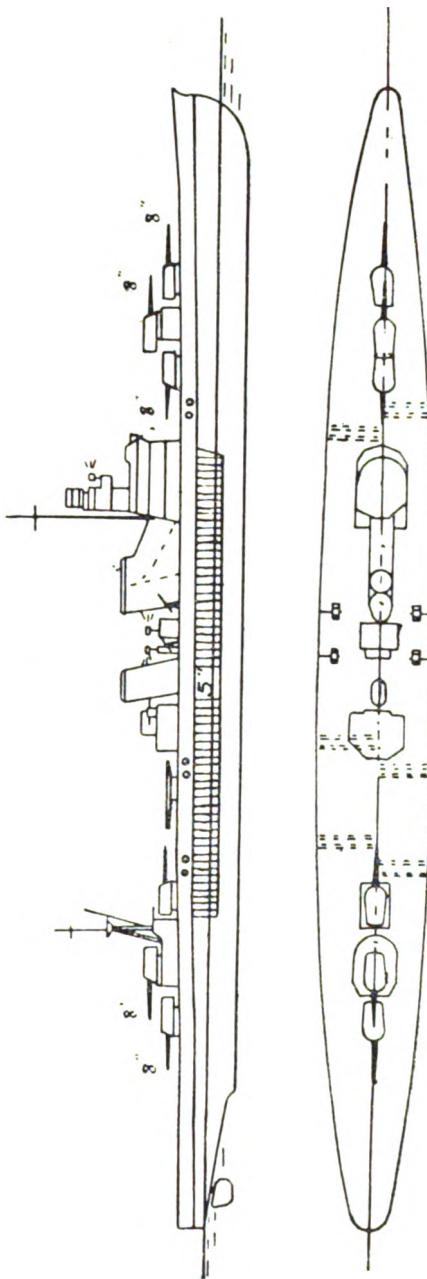
JAPAN.

CRUISERS.

*"Furutaka" Class.*

Furutaka.

Kako.



Length (extreme), 595 ft.; 7,100 tons; Speed, 33 knots.  
 Armament, 6—8-in.; 4—3-in. A.A.; 12 above-water 21-in. torpedo tubes.  
 1 catapult; 1-2 aircraft.

Correction to plan: The tops of the funnels are square to the funnels,

JAPAN.

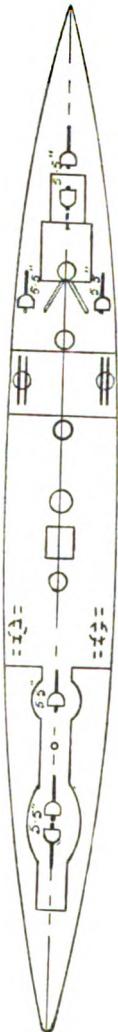
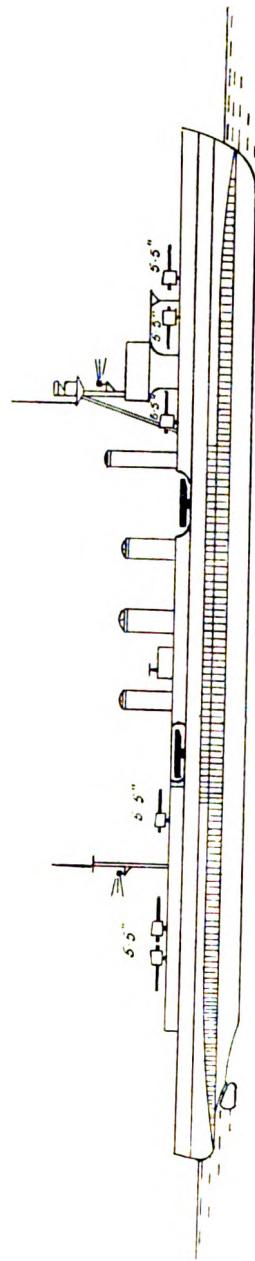
## LIGHT CRUISERS.

"Sendai" Class.

Naka.

Sendai.

Jintsu



Length (extreme) 535 ft.; Speed, 33 knots; 5,195 tons; Completed, 1924-25.  
Armament, 7-5-in.; 2-3-in. A.A.; 4 twin 21-in. torpedo tubes.  
1 seaplane.

Correction to plan : Bows of Jintsu and Naka have been modified to give more flair.

( P83 )

JAPAN.

LIGHT CRUISERS.

"Natori" Class.

\* Isuzu.  
Nagara.

\* Natori.  
Yura.

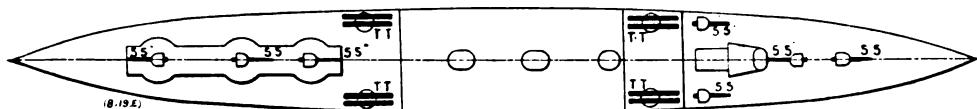
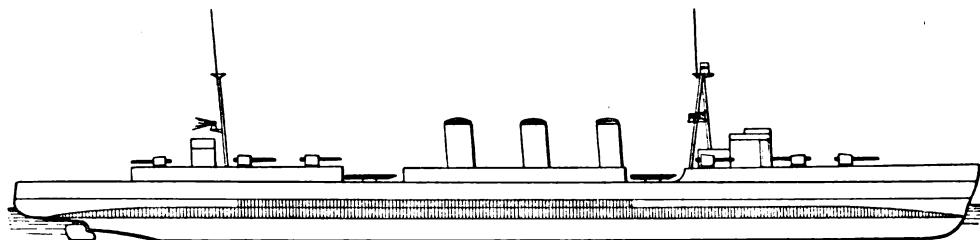
\* Kinu.  
(Abukuma).

"Kuma" Class.

Oi. Kiso.

Kitakami. Tama

Kuma.



Length (extreme), 535 ft.; Length B.P., 500 ft.; Speed, 33 knots; 5,100 tons; Completed, 1920-21.  
Armament, 7-5.5-in.; 2-3-in. A.A.; 2 M.; 4 twin above-water 21-in. torpedo tubes.

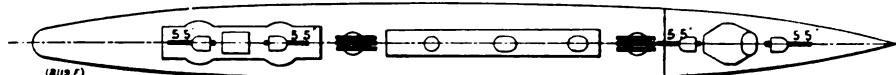
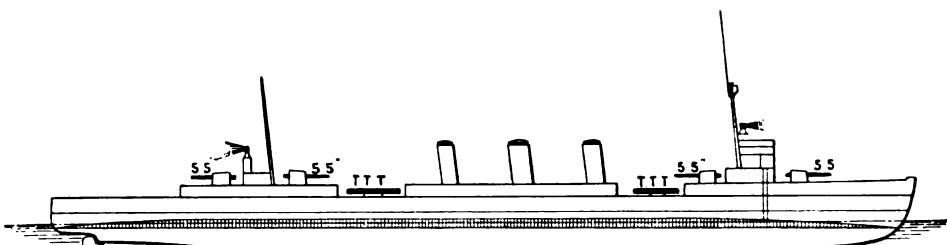
\* Plans apply generally to these vessels except that aircraft hangar and a catapult are arranged in bridge structure.  
The displacement is 70 tons higher than Oi, etc. These vessels were completed, 1922-23.

LIGHT CRUISERS.

"Tenryu" Class.

Tatsuta.

Tenryu.

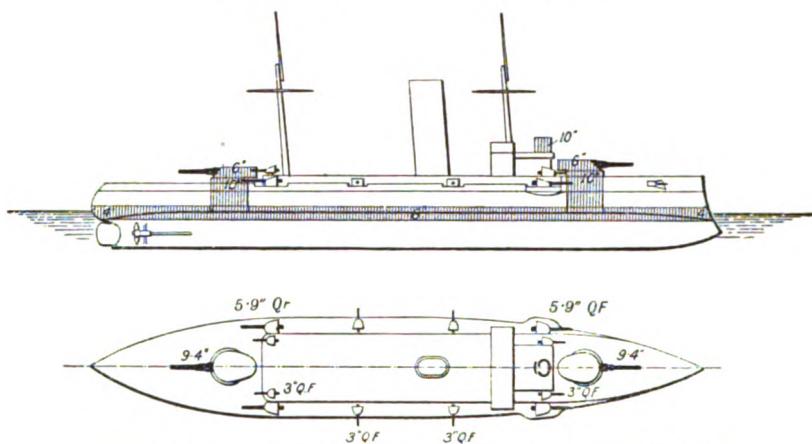


Length (extreme), 468 ft.; Speed, 31 knots; 3,230 tons; Completed, 1919.  
Armament, 4-5.5-in.; 1-3-in. A.A.; 2 M.; 2 triple above-water torpedo tubes.  
Fitted for Minelaying.

## NETHERLANDS.

## COAST DEFENCE SHIPS.

Hertog Hendrik. Marten Tromp.



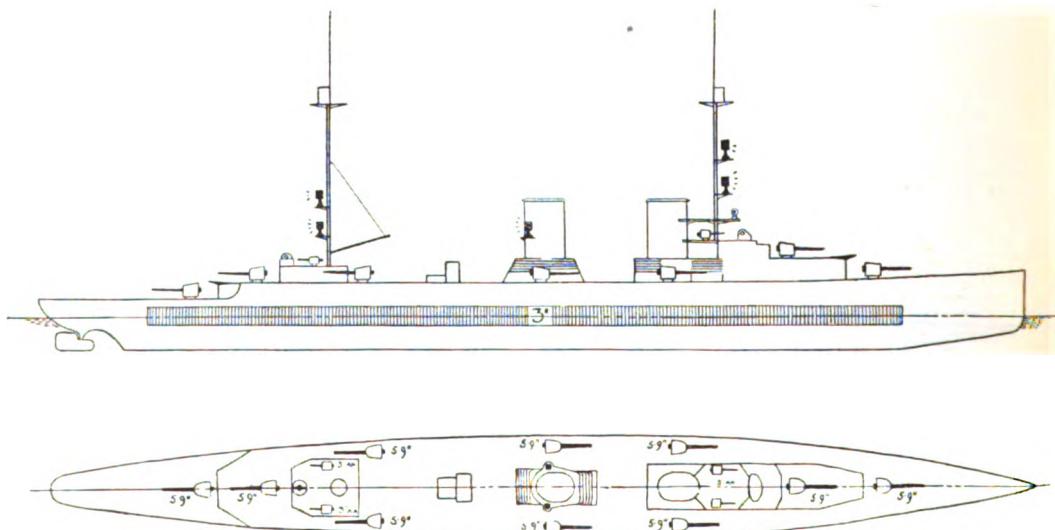
Hertog Hendrik : Length, 317 ft.; 4,371 tons; Speed, 16 knots; Completed, 1903.  
2—9·4-in.; 6—5·9-in.; 4—3-in.; 7 small.

Marten Tromp : Length, 330 ft.; 4,562 tons; Speed, 16 knots; Completed, 1906.  
2—9·4-in.; 4—5·9-in.; 8—3-in.; 7 small.

## NETHERLANDS.

## CRUISERS.

Java. Sumatra.

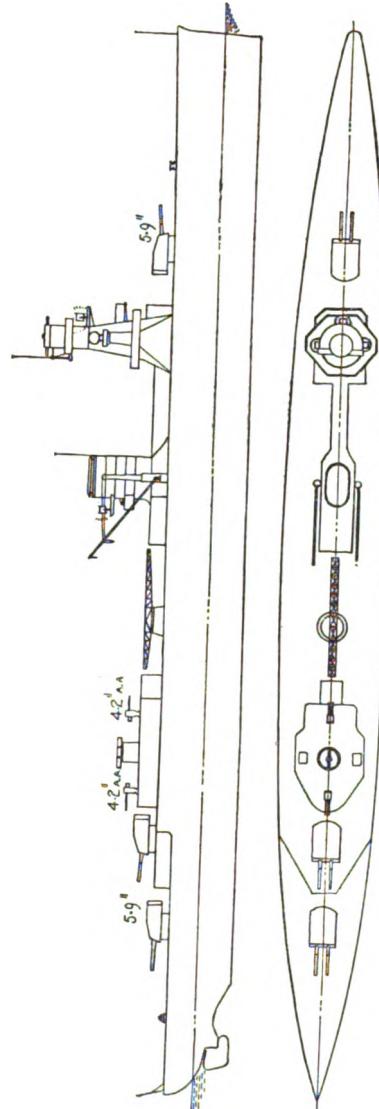


Length, 509½ ft.; 6,670 tons; Speed, 30 knots; Completed, 1925-26  
Armament, 10—5·9 in.; 4—3-in. A.A.; 8 M.  
40 mines; 2 seaplanes.

## NETHERLANDS.

CRUISER.

Celebes.



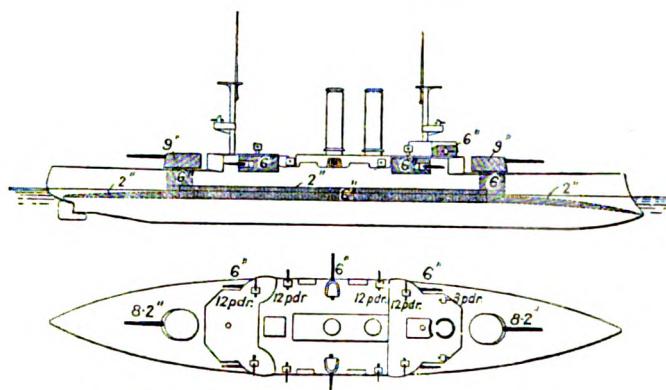
Length (extreme) 560 ft.; 5,900 tons; Speed, 32 knots.  
 Armament, 6—5.9-in.; 4—4.2-in. A.A.; 4 M.; 1 catapult; 2 seaplanes,  
 Building at Rotterdam.

## NORWAY.

## **COAST DEFENCE SHIPS.**

Norge

Eidsvold

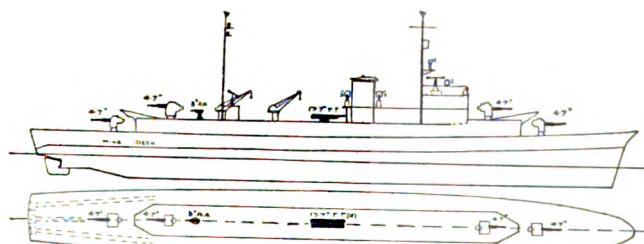


Length, 310 ft.; 4,166 tons; Speed, 16·5 knots; Completed, 1901.  
Armament, 2-8·2-in.; 6-6-in.; 8-3-in.; 6-3-pr.; 2 submerged 18-in. torpedo tubes.

NORWAY.

## **MINELAYER AND TRAINING SHIP**

Olav Trygvason.

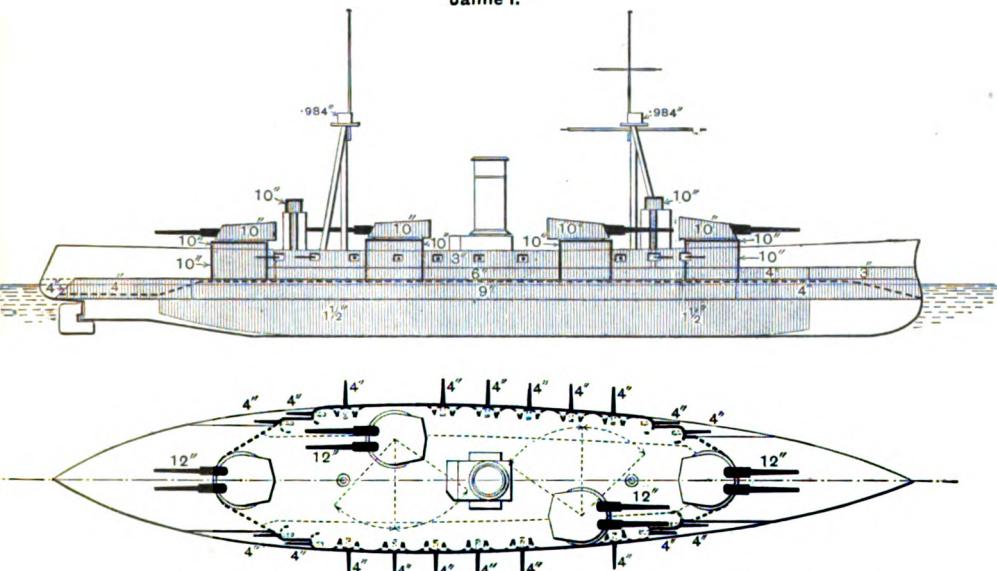


Length, 319 $\frac{1}{4}$  ft.; 1,747 tons; speed, 21 $\frac{1}{4}$  knots; Completed, 1934.  
Armament, 4-4'7-in.; 1-3-in. A.A.; 2-17'7-in. torpedo tubes.  
280 mines.

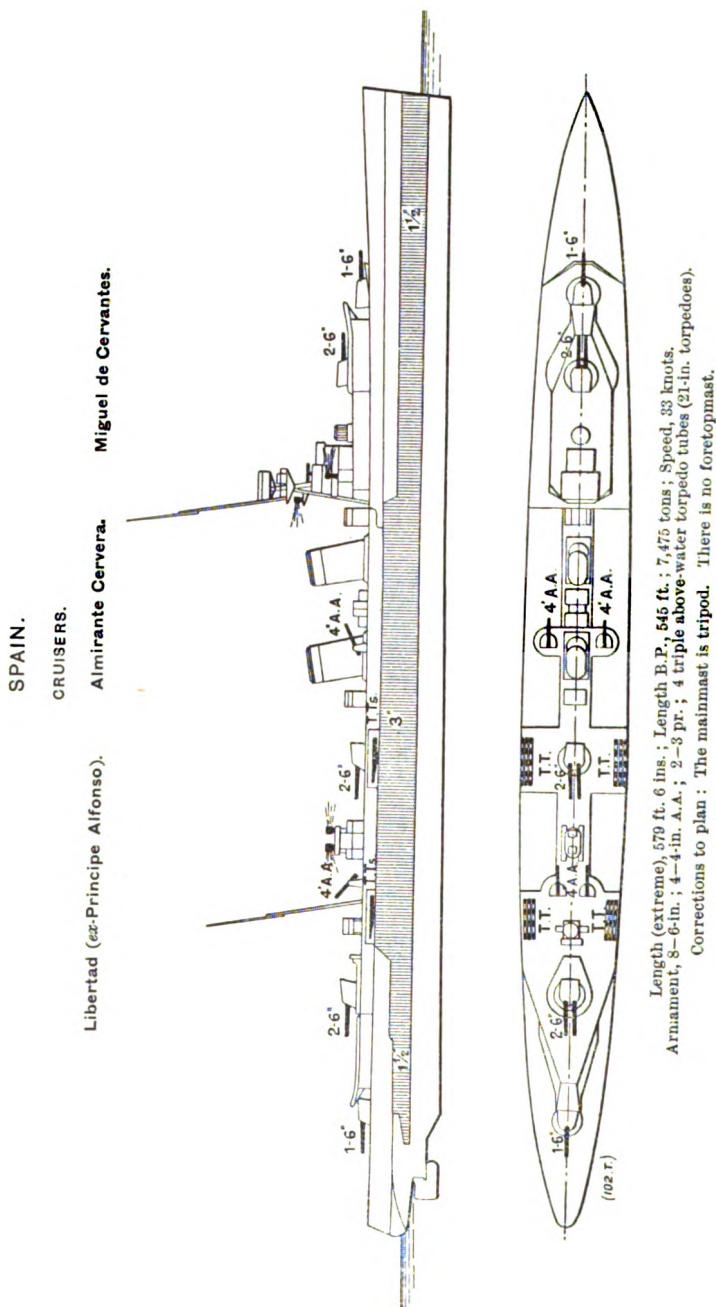
**SPAIN.**

**BATTLESHIP.**

**Jaime I.**



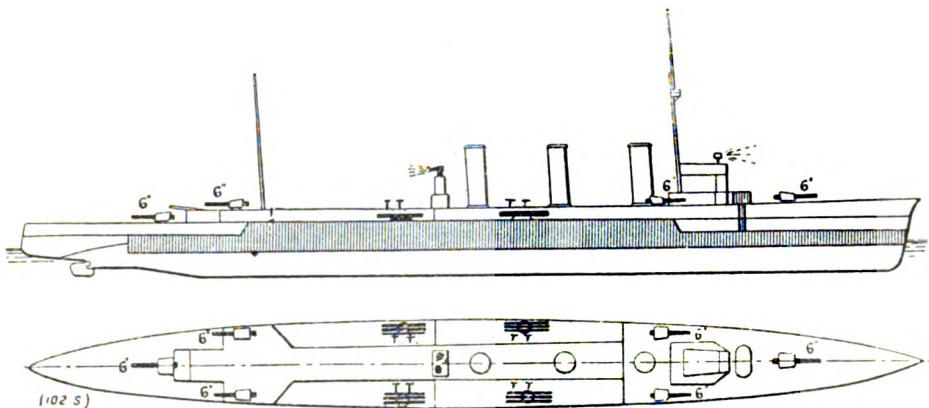
Length (extreme), 459 ft.; Length W.L., 435 ft.; 14,224 tons; Speed, 19.5 knots; Completed, 1921.  
Armament, 8—12-in.; 20—4-in.; 4—3-pr.; 4—3 pr. A.A.; 2 M.



## SPAIN.

## LIGHT CRUISER.

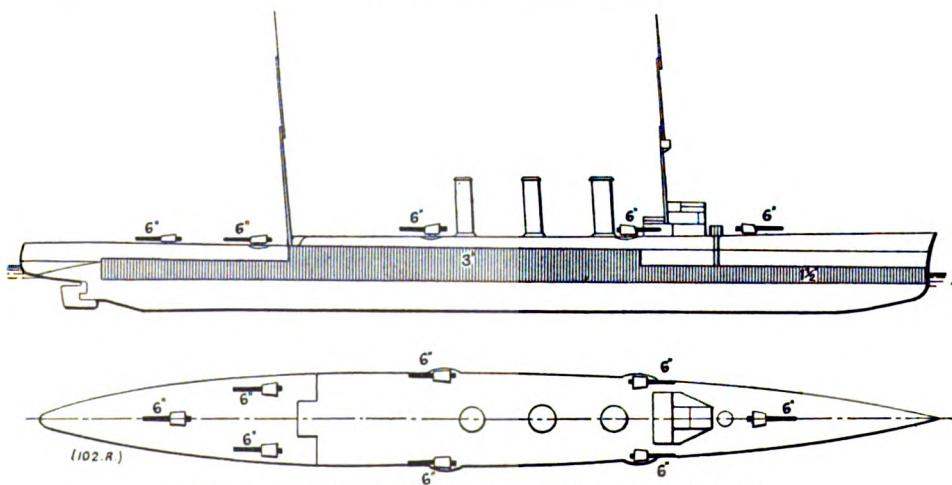
## Mendez Nuñez.



Length (extreme), 462 ft.; Length B.P., 439 ft.; 4,509 tons; Speed, 29 knots. Completed, 1924.  
Armament, 6—6-in.; 4—3-pr. A.A.; 4 M.; 4 above-water triple torpedo tubes (21-in. torpedoes).

NOTE.—The armour belt is 3 ins. thick, tapering to  $1\frac{1}{2}$  ins. at the ends.

## LIGHT CRUISER.

República (*ex-Reina Victoria Eugenia*).

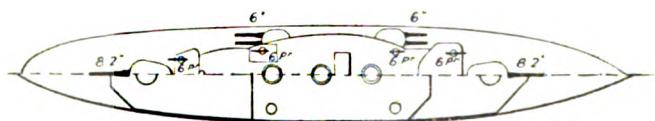
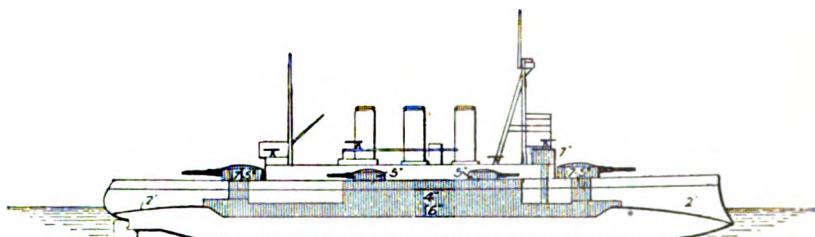
Length (extreme), 462 ft.; 4,857 tons; Speed, 25½ knots; Completed, 1922.  
Armament, 9—6-in.; 1—3-in.; 4—3-pr. A.A.; 4 M.; 1 L.; 4—21-in. torpedo tubes.

\* Correction to plan: There should be two 6-in. guns abreast forward instead of one on the centre line as shown.

**SWEDEN.**

**BATTLESHIP.**

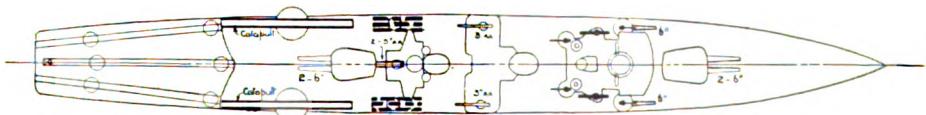
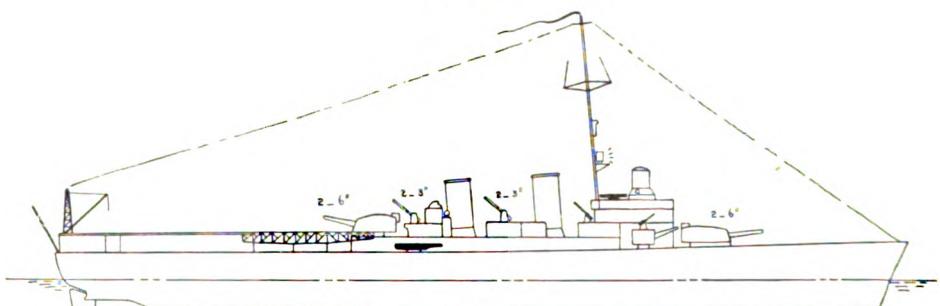
**Oscar II.**



Length, 313·6 ft.; 4,085 tons; Speed, 18 knots; Completed, 1907.  
Armament, 2—8·2-in.; 8—6-in.; 8—6-pr.; 1—1-pr.; 2 submerged 18-in. torpedo tubes.

**AIRCRAFT CRUISER.**

**Gotland.**



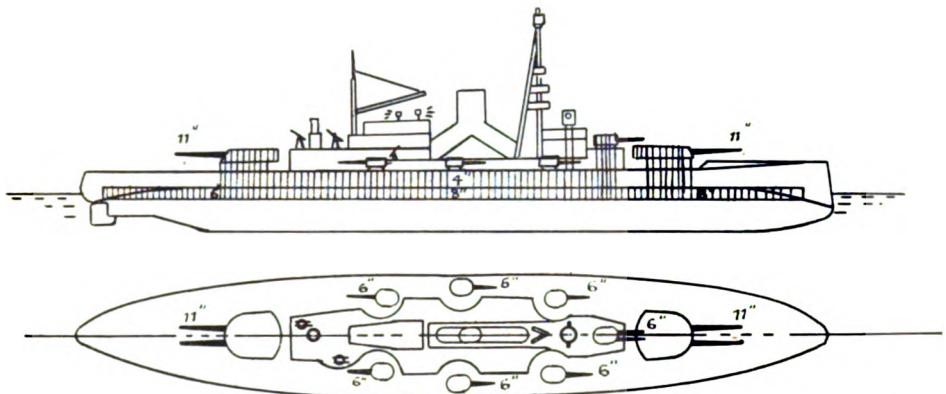
Length, 442 ft.; 4,527 tons; 33,000 H.P.; Speed, 27 knots. Building (estimated completion, 1934).  
Armament, 6—6-in.; 4—3-in. A.A.; 4 M.; 6—21-in. torpedo tubes.

Correction to plan : 1 middle line catapult will be fitted instead of two.

SWEDEN.

COAST DEFENCE SHIPS.

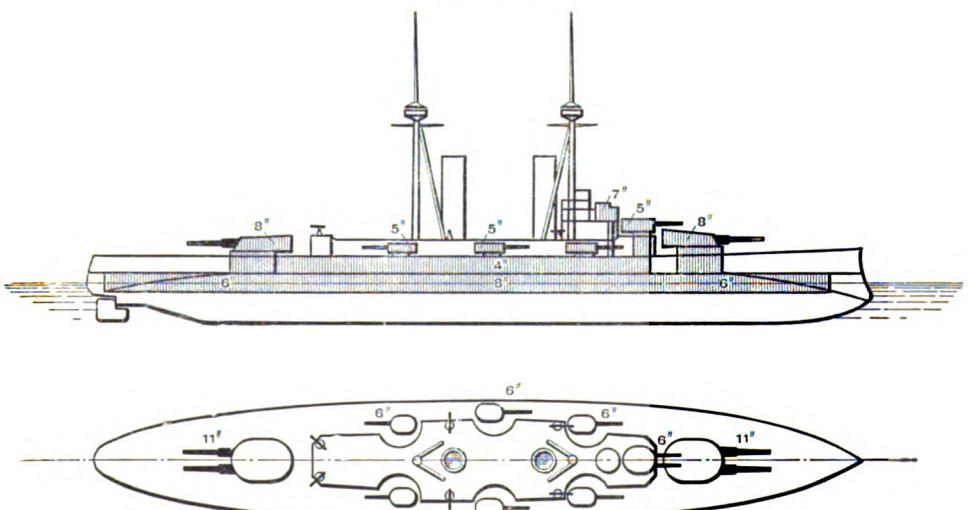
**Gustav V.**                    **Sverige.**  
(As reconstructed 1924-29.)



Length, 396·7 ft. ; 6,899 tons ; Speed, 22 knots ; Completed, 1917-1921.  
Armament, 4—11-in. ; 8—6-in. ; 6—3-in. ; 2—6-pr. ; 2 M.

COAST DEFENCE SHIP.

\***Drottning Victoria.**



Length, 396·7 ft. ; 6,899 tons ; Speed, 23 knots ; Completed, 1921.  
Armament, 4—11-in. ; 8—6-in. ; 6—3-in. ; 2—6-pr. ; 2 M.

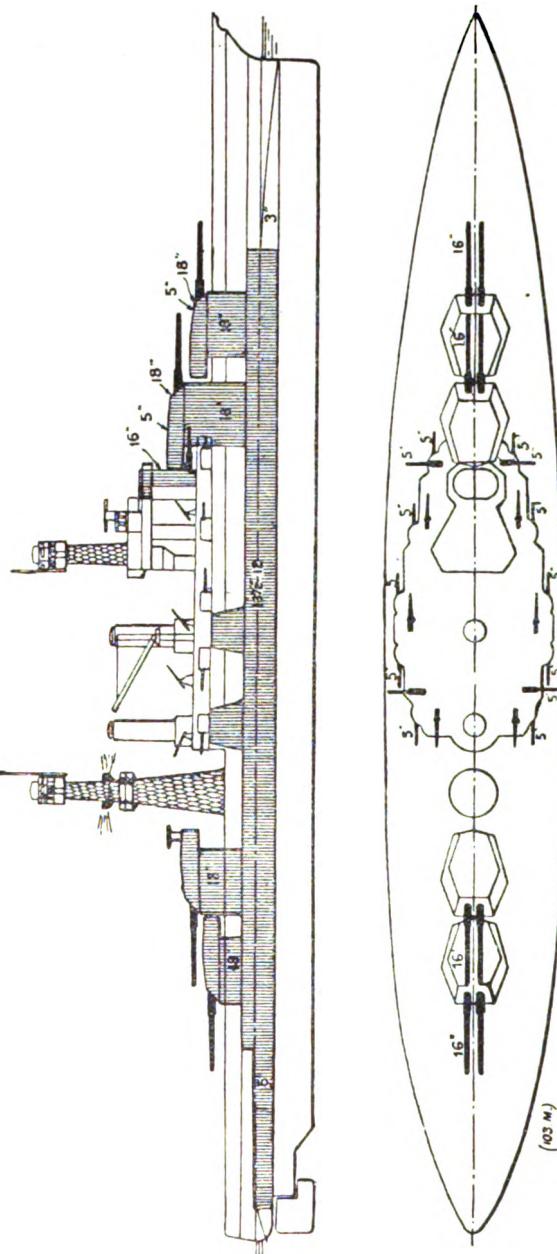
\* To be reconstructed and modernised as Gustav V and Sverige above.

## UNITED STATES;

## BATTLESHIPS.

Maryland.      West Virginia.

Colorado.



Length (extreme), 624 ft.; Length W.L., 600 ft.; Speed, 21 knots; Displacement, 32,600 tons; Maryland, completed, 1921; Colorado and West Virginia, completed, 1923.

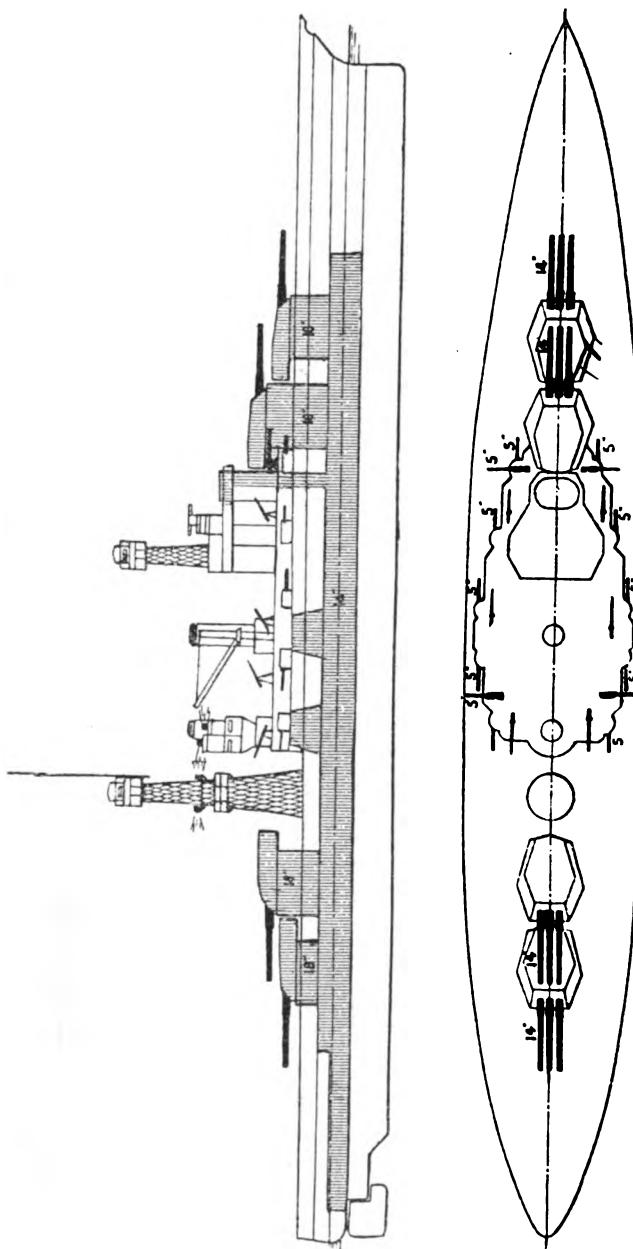
Armament 8-16-in.; 8-5-in.; 12-5-in.; 4-6-pr. A.A.; 2 submerged 21-in. torpedo tubes.  
Catapult mounted right aft on Quarter Deck; 3 aircraft.

UNITED STATES.

BATTLESHIPS.

California.

Tennessee.



( P93 )

Length (extreme), 624 ft.; Length W.L., 600 ft.; Speed, 21 knots; \$2,800 tons; Completed, 1920-21.  
Armament, 12-14-in.; 12-5-in.; 8-5-in. A.A.; 4-6-pr.; 2-1-pr.; 2 submerged 21-in. torpedo tubes.  
2 catapults (one right aft on Quarter Deck and one on the third turret); 3 seaplanes.

## UNITED STATES.

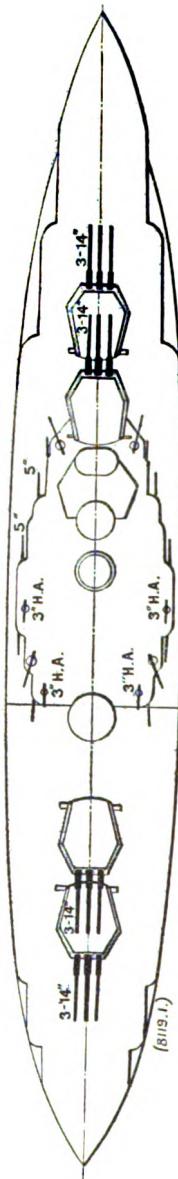
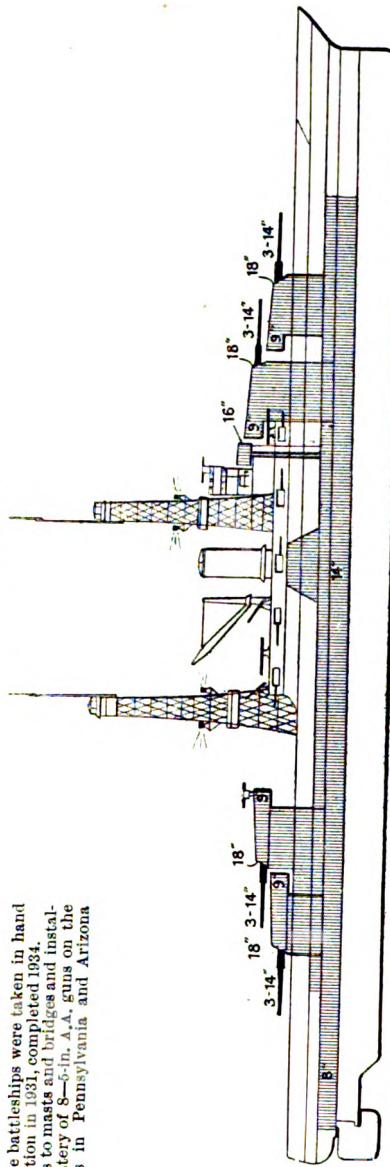
BATTLESHIPS,

New Mexico.

(Before modernisation.)

Idaho.      Mississippi.

These three battleships were taken in hand for modernisation in 1931, completed 1934.  
 Alterations to masts and bridges and installation of a battery of 8-in. A.A. guns on the same lines as in Pennsylvania and Arizona (see p. P96).



Length (extreme), 624 ft.; Length W.L., 600 ft.; Speed, 21 knots; Displacement, 32,000 tons; Completed, 1917-19.  
 Armament, 12-14-in.; 12-6-in.; 8-3-in. A.A.; 4-6-pr. & 2 submerged 21-in. torpedo tubes.

\* Idaho, 4-8-pr.

Catapult mounted right aft on Quarter Deck; 3 aircraft.

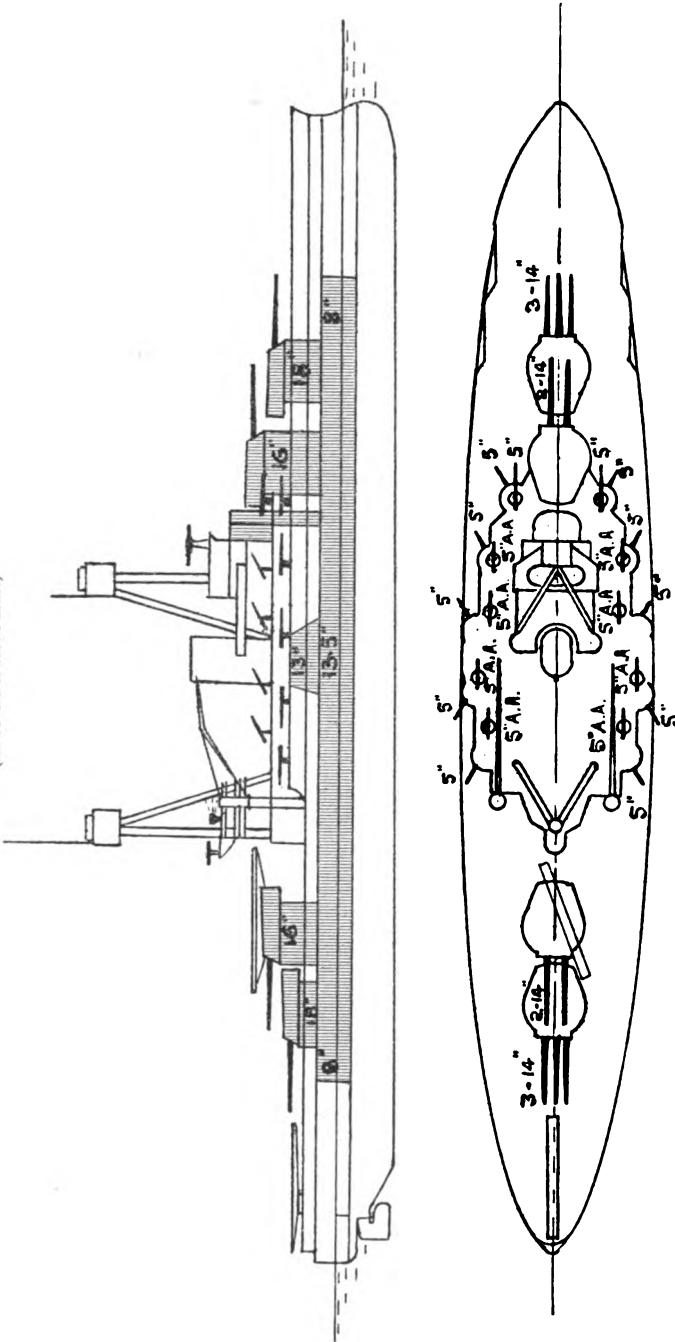
Mississippi has an additional turret catapult.

## UNITED STATES.

## BATTLESHIPS.

Nevada. Oklahoma.

(As reconstructed 1929.)

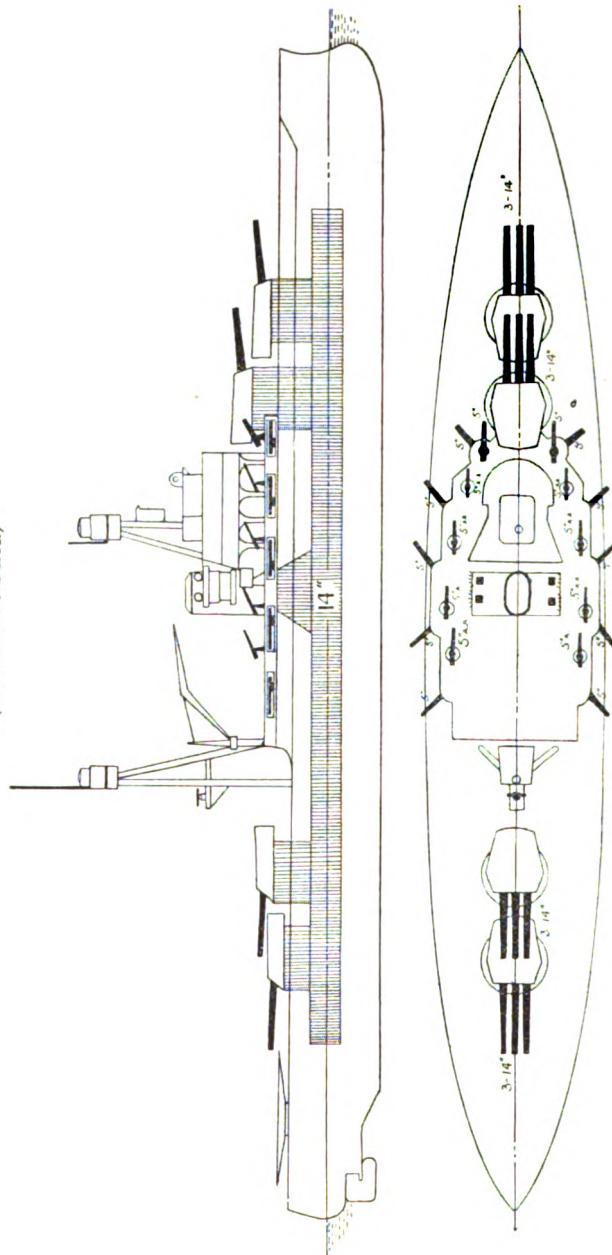


Length (extreme), 633 ft.; Length W.L., 575 ft.; Speed, 20.5 knots; 39,000 tons.  
 Armament, 10—14-in.; 12—6-in. A.A.; 4—5-in. A.A.; 2—1-pr.; 2 M.; 2 L.; 2 catapults; 3 aeroplanes

## UNITED STATES.

## BATTLESHIPS.

**Arizona.**      Pennsylvania.  
 (As reconstructed 1931.)



Length (extreme) 608 ft.; Length B.P. 596 ft.; Speed, 21 knots; 32,100 tons; Completed, 1916.  
 Armament, 12-14-in.; 12-6-in.; 8-5-in.; 8-3-in. A.A.; 4-3-pr.; 2-1-pr.; 2 M.; 2 L.; 2 catapults; 3 aircraft.

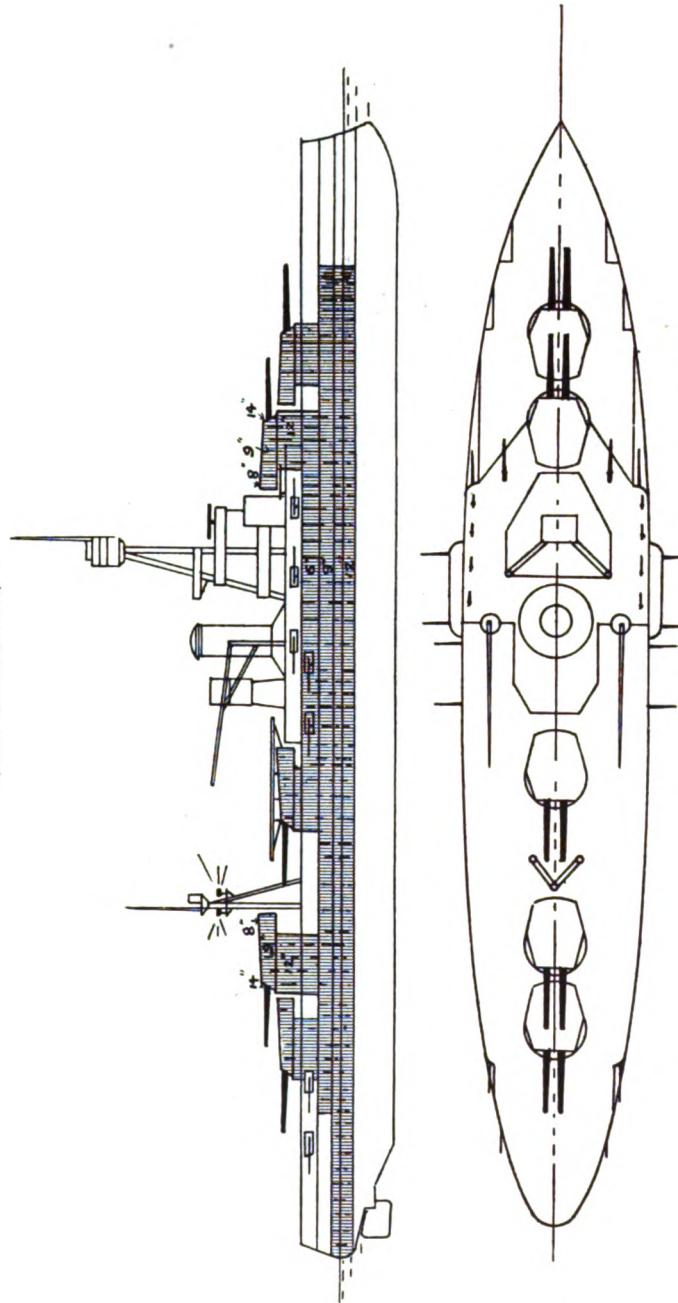
## UNITED STATES.

## BATTLESHIPS.

## New York.

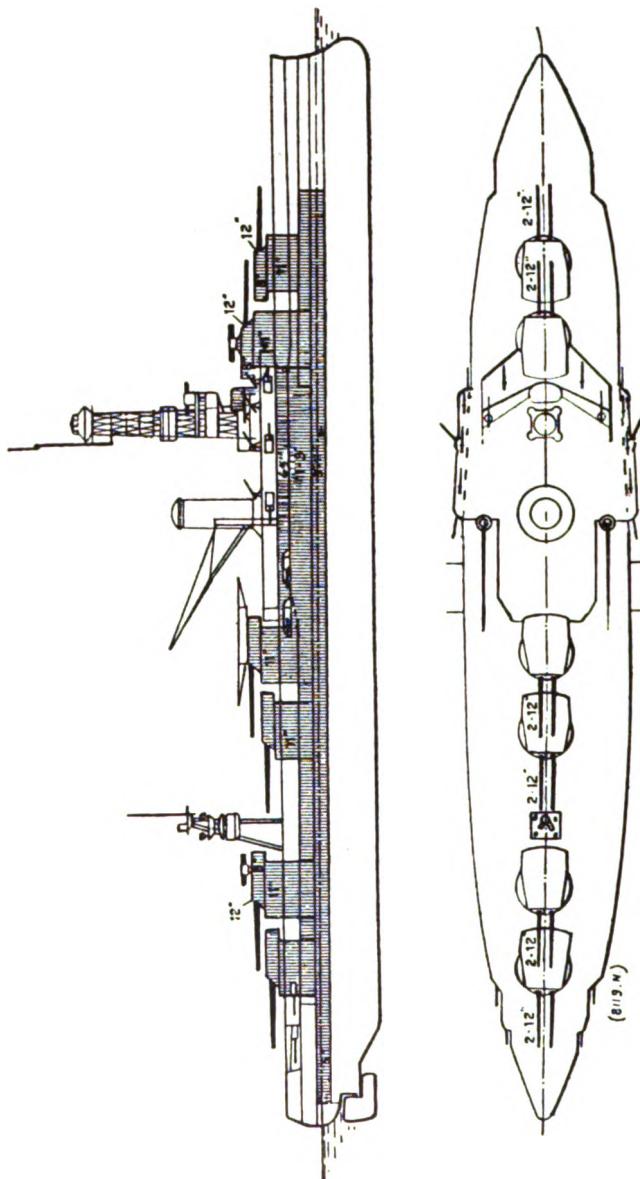
Texas.

(As reconstructed 1927.)



Length (extreme), 673 ft.; Length W L., 565 ft.; Speed, 21 knots; Displacement, 27,000 tons; Completed, 1914.  
Armament, 10—14-in.; 16—5-in.; 8—3-in. A.A.; 4—3-pr.; 2—1-pr.; 3 aircraft; 1 catapult; 3 aircraft.

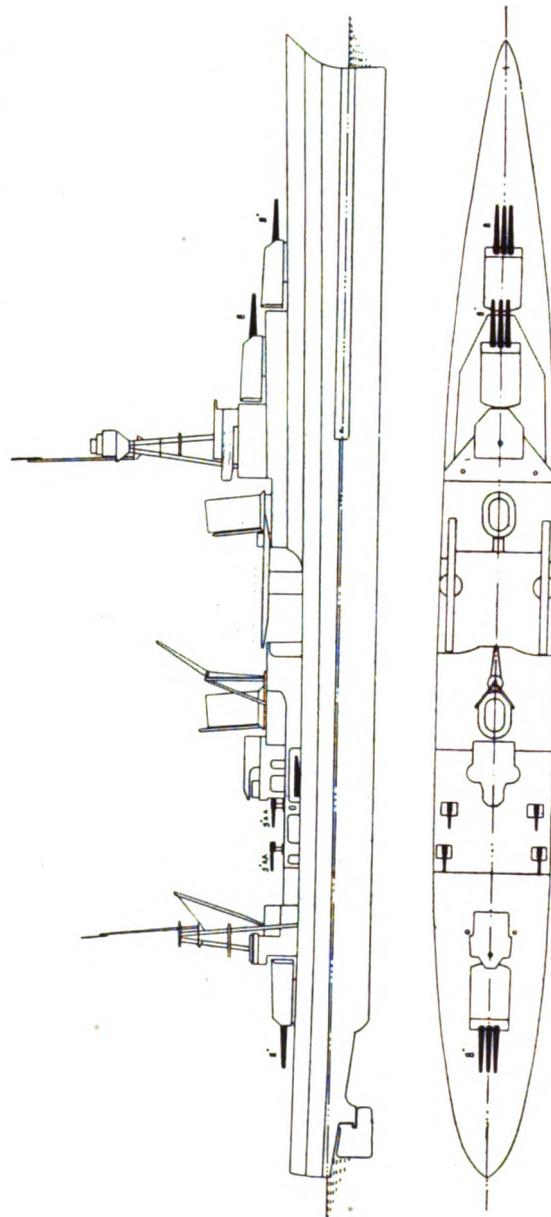
UNITED STATES.  
BATTLESHIP.  
Arkansas.  
(As reconstructed 1927.)



Length (extreme) 562 ft.; Length, W.L., 564 ft.; Speed, 20½ knots; Displacement, 26,100 tons; Completed, 1912. Armament, 12-12-in.; 16-5-in.; 8-3-in. A.A.; 4-8-pr. 2-1-pr.; 2 M.; 1 catapult; 3 aircraft. Wyoming, a sister ship, has been demilitarised and converted to a training ship.

## UNITED STATES.

Northampton.      Chester.      Louisville. ("Chester" Class.)      Houston.      Augusta. ("Augusta" Class.)



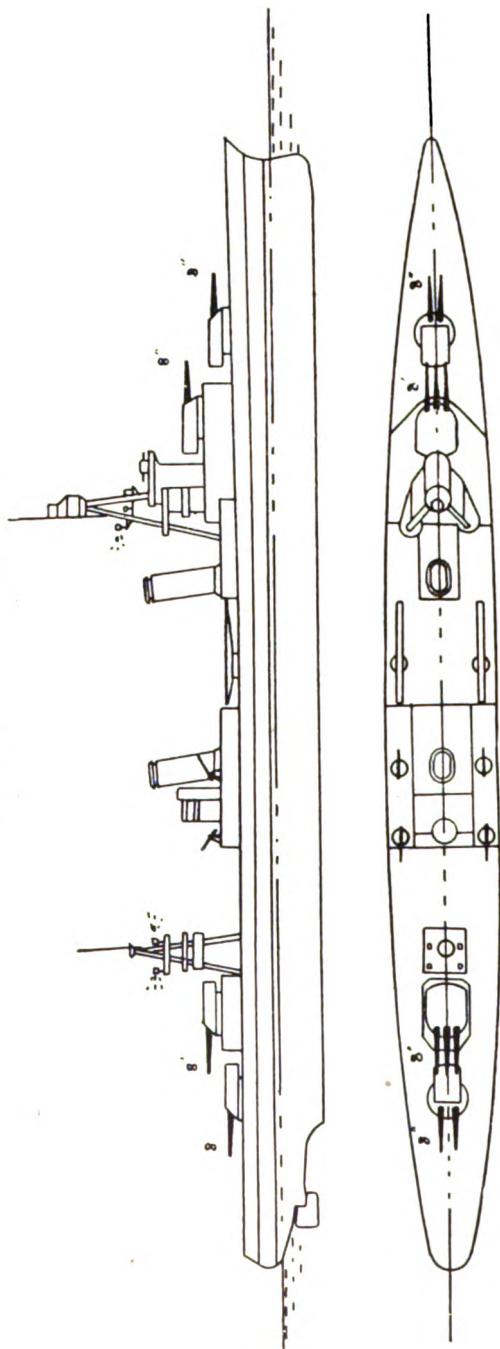
"Chester" and "Augusta" Classes: Length (extreme), 600 ft.; 9,050-9,300 tons; Speed, 32.5 knots; Completed, 1930-31.  
Armament, 9-8-in.; 4-5-in.; 2-3-pr.; 2 triple 21-in. torpedo tubes; 2 catapults; 4-6 seaplanes.

## UNITED STATES.

## CRUISERS.

*"Pensacola" Class.*

Salt Lake City. Pensacola.



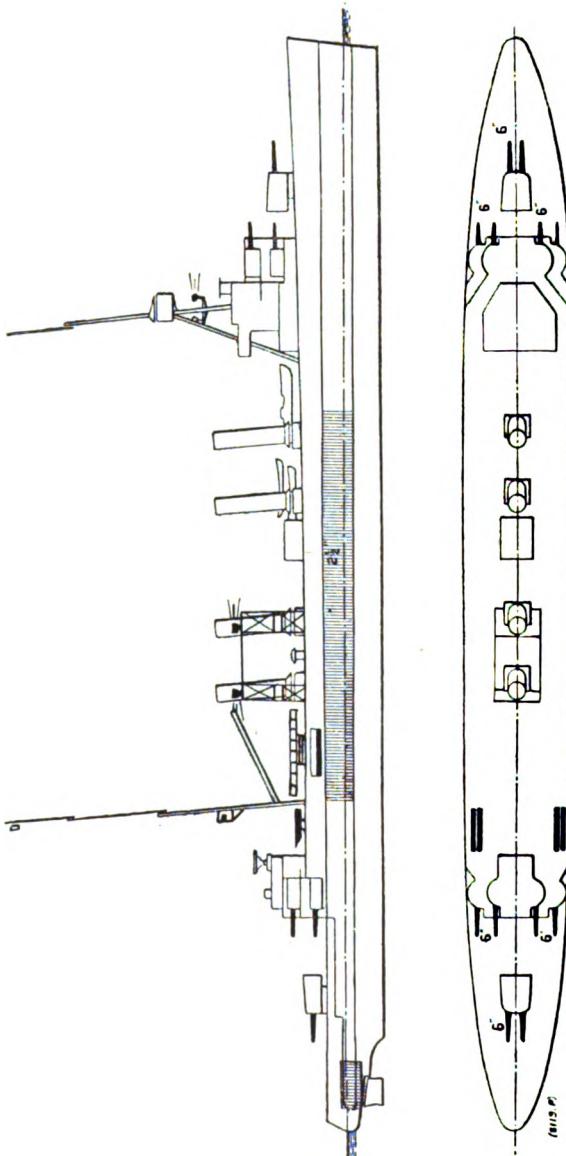
Length (extreme) 685 ft.; 9,100 tons; Speed, 32½ knots; Completed, 1930.  
Armament, 10-8-in.; 4-5-in. A.A.; 2-3-pr.; 9 triple 21-in. torpedo tubes.  
2 catapults; 4 seaplanes.

UNITED STATES.

**SCOUT CRUISERS.**

"Omaha" Class.

Cincinnati.	Concord.	Detroit.	Memphis.	Milwaukee.	Omaha.
		Raleigh.	Trenton.		

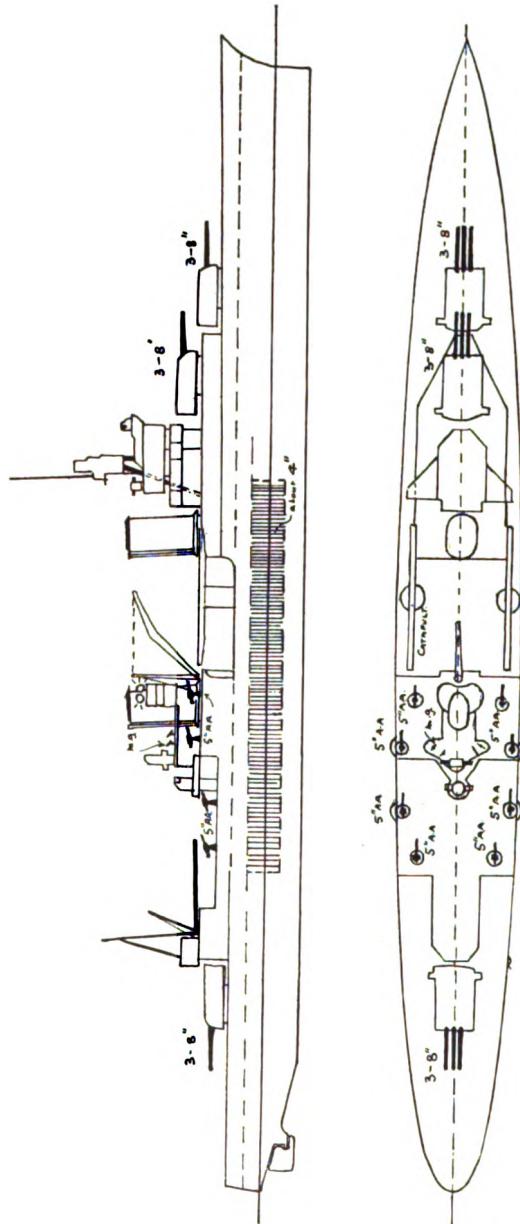


Length (extreme), 555 ft. 6 ins.; Length W.L., 550 ft.; Speed, 33·7 knots; 7,050 tons. Completed in 1923-25.

Armament, 12-6-in. (Marblehead, 11-6-in.); Cincinnati, Detroit, Raleigh and Richmond, 10-6-in.); 4-3-in. A.A.; 2-3-pr.; 2 triple above-water 21-in. torpedo tubes; 2 catapults; 2 aeroplanes.

Corrections to plan : The pair of single 6-in. guns at upper deck level aft are removed in Marblehead, Cincinnati, Detroit, Raleigh and Richmond. In Marblehead there is a single gun on top of the after battery.

UNITED STATES.  
CRUISERS.  
Indianapolis.  
Portland.

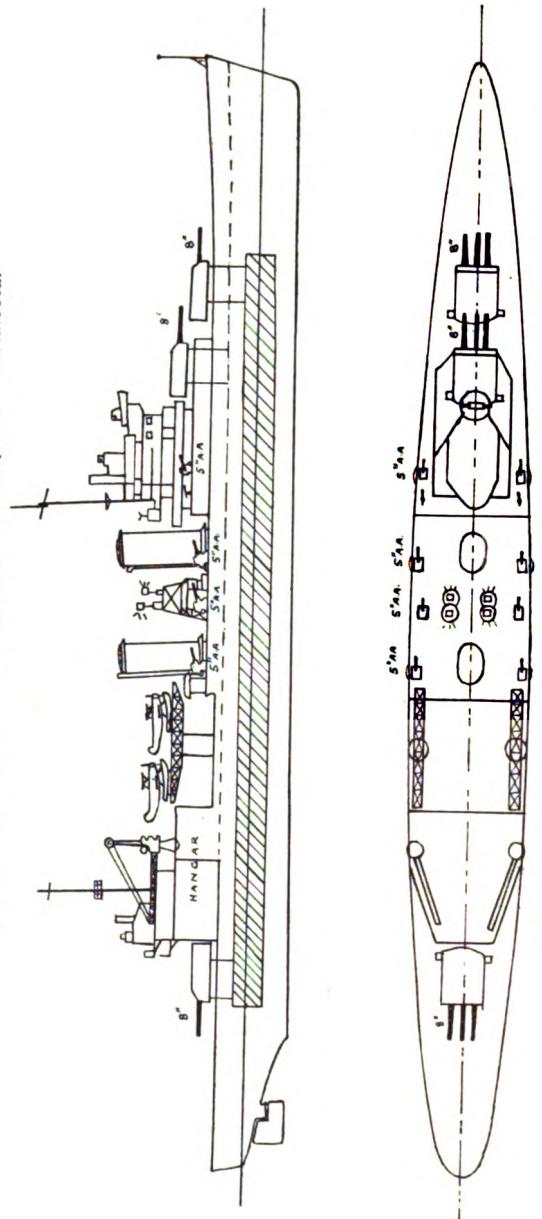


Length, Indianapolis, 584 ft. on W.L.; Portland, 582 ft. on W.L. Indianapolis, 9,950 to s; Portland, 9,800 tons. Speed, 22½ knots. Completed, 1922-1933. Armament, 9-8-in., 8-6-in. A.A.; 10 machine guns; 2 catapults; 4-6 aircraft.

## UNITED STATES.

## CRUISERS.

"Astoria" Class.  
 Astoria.      New Orleans.      San Francisco.      Minneapolis.      Tuscaloosa.

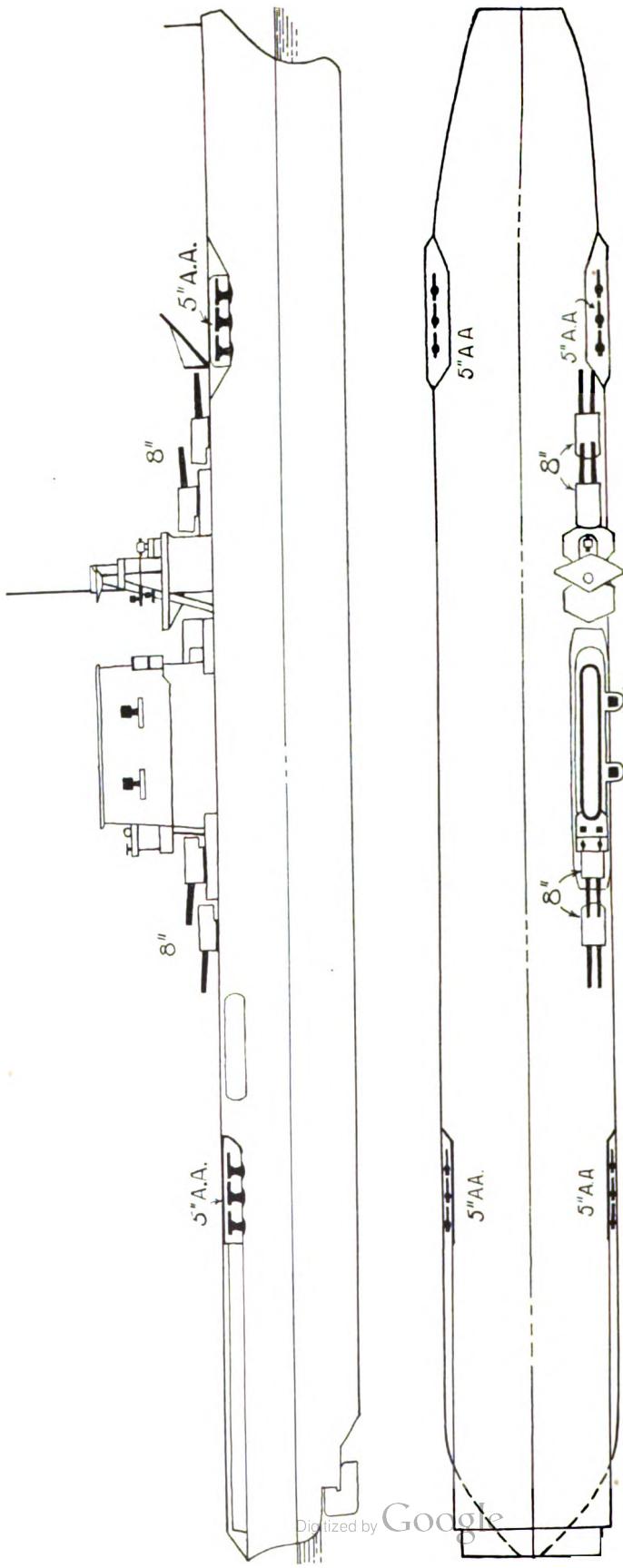


Length (extreme), 578 ft., 10,000 tons (estd.). Speed, 32½ knots. Completed, 1934.  
 Armament, 9-8-in., 8-6-in., 10 smaller; 2 catapults; 4-6 aircraft.

## UNITED STATES.

## AIRCRAFT CARRIERS.

Lexington. Saratoga.



Length (extreme), Lexington, 880 ft.; Saratoga, 888 ft.; 33,000 tons; Speed, 33½ knots; Completed, 1927.  
Armament, 8-8-in.; 12-5-in. A.A.; 4-6-pr.; Operate about 80 aircraft.

PROFILES OF  
MERCHANT SHIPS.



MERCHANT SHIPS.



AQUITANIA. Cunard White Star. Length, 868 ft. 7 ins.; Gross Tonnage, 45,647;  
Funnels: Red, with Black Tops and Three Black Rings.



OLYMPIC. Cunard White Star. Length, 852 ft. 5 ins.; Gross Tonnage, 46,439;  
Funnels: Buff, Black Tops.



MAURETANIA. Cunard White Star. Length, 762 ft. 2 ins.; Gross Tonnage, 30,696;  
Funnels: Red, with Black Tops and Three Black Rings.



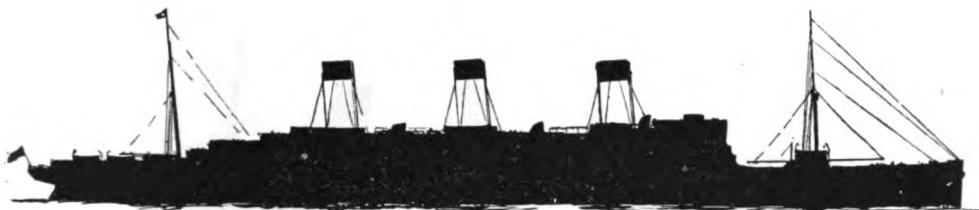
ARUNDEL CASTLE. WINDSOR CASTLE. Union Castle. Length, 630 ft. 5 ins. and 632 ft. 4 ins.  
Gross Tonnage, 19,029 and 18,973;  
Funnels: Red, Black Tops.



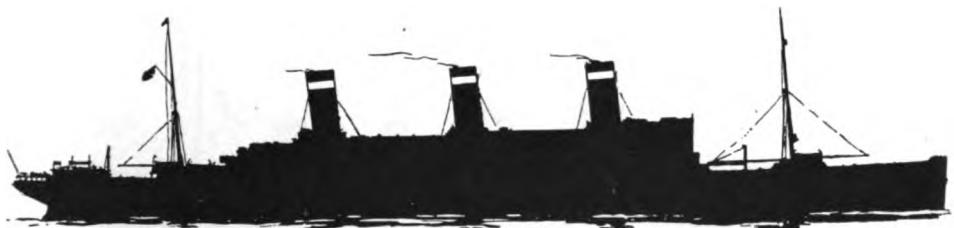
**NORMANDIE.** Cie. Générale Transatlantique. Length, 1,029 ft. overall; Gross Tonnage, 79,280;  
Funnels: Red, Black Tops.



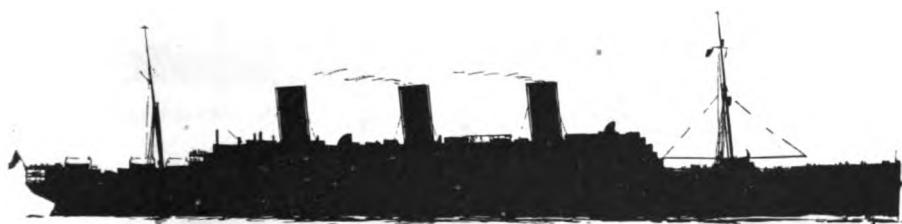
**QUEEN MARY.** Cunard White Star. Length, 1,018 ft. overall; Gross Tonnage, 73,000;  
Funnels: Red, with Black Tops and Three Black Rings.



**MAJESTIC.** Cunard White Star. Length, 915 ft. 5 ins.; Gross Tonnage, 56,599;  
Funnels: Buff, Black Tops.



**LEVIATHAN.** United States Lines. Length, 907 ft. 6 ins.; Gross Tonnage, 48,943;  
Funnels: Red, White Band, Blue Tops.



**BERENGARIA.** Cunard White Star. Length, 883 ft. 6 ins.; Gross Tonnage, 52,101;  
Funnels: Red, with Black Tops and Three Red Rings.



**ILE DE FRANCE.** Cie. Générale Transatlantique. Length, 763 ft. 7 ins.; Gross Tonnage, 43,450;  
Funnels: Red, Black Tops.



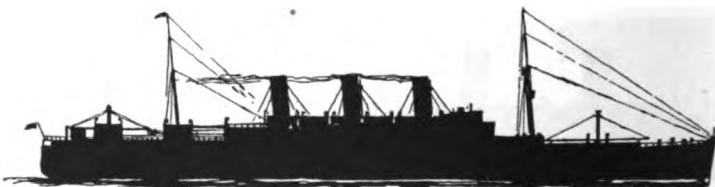
**PARIS.** Cie. Générale Transatlantique. Length, 735 ft. 4 ins.; Gross Tonnage, 34,569;  
Funnels: Red, Black Tops.



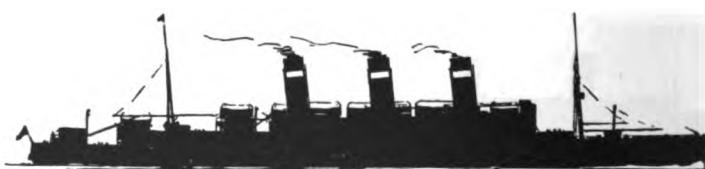
**EMPRESS OF BRITAIN.** Canadian Pacific. Length, 733 ft. 3 ins.;  
Gross Tonnage, 42,348; Funnels : Yellow.



**L'ATLANTIQUE.** Cie. Sud Atlantique. Length, 713 ft. 6 ins.;  
Gross Tonnage, 42,512; Funnels : Buff, Black Tops.  
(Gutted by fire on January 5, 1933.)



**STATENDAM.** Holland-Amerika. Length, 674 ft. 2 ins.; Gross Tonnage, 28,291; Funnels : Buff, White Band between Two Green.



**BELGENLAND.** Red Star. Length, 670 ft. 4 ins.; Gross Tonnage, 27,132; Funnels : Black, White Band.



**EMPRESS OF JAPAN.** Canadian Pacific. Length, 644 ft. Gross Tonnage, 26,032; Funnels, Buff.



**CAP ARCONA.** Hamburg-South Amerika Line. Length, 643 ft. 6 ins.; Gross Tonnage, 27,561; Funnels: White, Red Tops.



**STRATHNAVER. STRATHAIRD.** Peninsular and Oriental. Length, 638 ft. 7 ins. and 638 ft.; Gross Tonnage, 22,283 and 22,284; Funnels: Yellow. Hulls: White.



**CAP POLONIO.** Hamburg-South Amerika. Length, 637 ft. 8 ins. Gross Tonnage, 21,011; Funnels: White, Red Tops.



**EMPRESS OF CANADA.** Canadian Pacific. Length, 627 ft.; Gross Tonnage, 21,517; Funnels: Yellow.



**RELIANCE. RESOLUTE.** Hamburg-Amerika Line. Length, 590 ft. 4 ins.; Gross Tonnage, 19,821 and 19,703; Funnels: Yellow, with Black, White and Red Bands at Top.



**EMPRESS OF AUSTRALIA.** Canadian Pacific. Length, 589 ft. 9 ins.; Gross Tonnage, 21,883; Funnels: Yellow.



**NALDERA.** Peninsular and Oriental. Length, 580 ft. 9 ins.; Gross Tonnage, 16,113;  
**NARKUNDA.** " " Length, 581 ft. 4 ins.; Gross Tonnage, 16,632;  
Funnels: Black.

(The Narkunda is similar to the Naldera, but has raised forecastle.)



**LUTETIA.** Cie. Sud Atlantique. Length, 579 ft.; Gross Tonnage, 14,783  
Funnels: Buff, Black Tops.



**MASSILIA.** Cie. Sud Atlantique. Length, 577 ft. 1 in.; Gross Tonnage, 15,363;  
Funnels: Buff, Black Tops.



**EMPEROR OF ASIA.** **EMPEROR OF RUSSIA.** Canadian Pacific.  
Length, 570 ft.; Gross Tonnage, 16,900 and 16,810;  
Funnels: Yellow.



**MONARCH OF BERMUDA.** **QUEEN OF BERMUDA.** Furness Withy.  
Length, 553 ft. 4 ins.; Gross Tonnage, 22,424 and 22,575;  
Funnels: Black, with Two Red Bands.



**TRANSYLVANIA.** **CALEDONIA.** Anchor.  
Length, 552 ft. 4 ins. and 553 ft.; Gross Tonnage, 16,923 and 17,046;  
Funnels: Black.



**CHAMPOILLION. MARIETTE PACHA.** Messageries Maritimes.  
Length, 495 ft. 1 in. and 508 ft. 5 ins.; Gross Tonnage, 12,263 and 12,239;  
Funnels: Black.



**TAIREA. TAKLIWA. TALAMBA.** British India S.N. Co.  
Length, 449 ft. 6 ins.; Gross Tonnage, 8,000;  
Funnels: Black, Two White Bands.



**PRINCE DAVID. PRINCE HENRY. PRINCE ROBERT.** Canadian National.  
Length, 366 ft. 4 ins.; Gross Tonnage, 6,892.



**PRINCESS KATHLEEN. PRINCESS MARQUERITE.** Canadian Pacific Railway.  
Length, 350 ft.; Gross Tonnage, 5,875;  
Funnels: Yellow, Black Tops.



**CIUDAD DE BUENOS AIRES.** Argentine S.M. Co. **CIUDAD DE MONTE VIDEO.**  
Uruguayan S.M. Co. Length, 350 ft.; Gross Tonnage, 3,987 and 3,872;  
Funnels: Yellow, Black Tops.



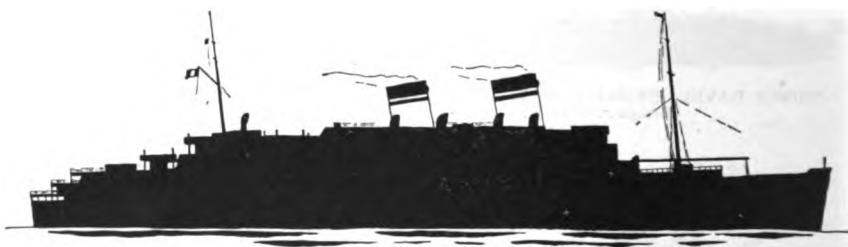
**PRINCESS ELAINE.** Canadian Pacific Railway. Length 291 ft.; Gross Tonnage, 2,027;  
Funnels: Yellow, Black Tops.



**BREMEN. EUROPA.** Norddeutscher Lloyd. Length, 898 ft. 7 ins. and 890 ft. 2 ins.; Gross Tonnage, 51,656 and 49,746; Funnels: Yellow.



**REX.** Italia Line. Length, 879 ft. 9 ins. overall; Gross Tonnage, 51,062; Funnels: White, with Green Stripe and Red Tops.



**CONTE DI SAVOIA.** Italia Line. Length, 814 ft. 6 ins. overall; Gross Tonnage, 48,502; Funnels: White, with Green Stripe and Red Tops.



**HOMERIC.** Cunard White Star. Length, 751 ft.; Gross Tonnage, 34,351; Funnels: Buff, Black Tops.



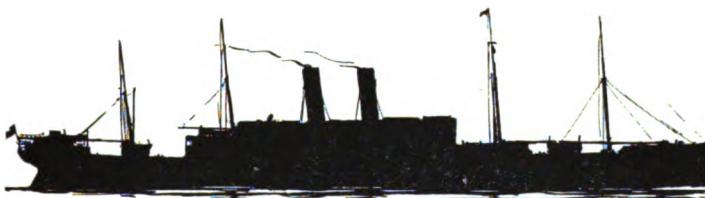
**COLUMBUS.** Norddeutscher Lloyd. Length, 749 ft. 6 ins. Gross Tonnage, 32,565; Funnels: Yellow.



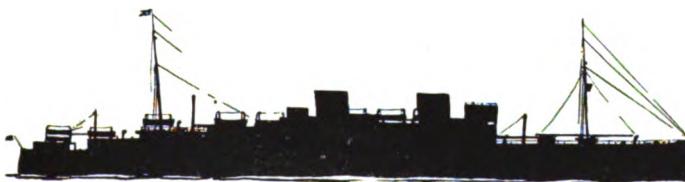
**M.S. AUGUSTUS.** Italia Line. Length, 710 ft. 9 ins.;  
Gross Tonnage, 30,418;  
Funnels: White, with Green Stripe and Red Tops.



**ROMA.** Italia Line. Length, 705 ft. 6 ins.; Gross Tonnage, 32,583;  
Funnels: White, with Green Stripe and Red Tops.



**GEORGE WASHINGTON.** United States Shipping Board. Length, 699 ft. 1 in.;  
Gross Tonnage, 23,788;  
Funnels: Black.



**M.S. BRITANNIC.** **M.S. GEORGIC.** Cunard White Star. Length, 683 ft. 6 ins.;  
Gross Tonnage, 26,943 and 27,759;  
Funnels: Buff, Black Tops.



**MANHATTAN.** **WASHINGTON.** United States Lines. Length, 668 ft. 4 ins.;  
Gross Tonnage, 24,289;  
Funnels: Red, White Band, Blue Tops.



**CONTE GRANDE. CONTE BIANCAMANO.** Italia Line.  
Length, 652 ft. 2 ins. and 650 ft. 9 ins.; Gross Tonnage, 25,661 and 24,416;  
Funnels : White, with Green Stripe and Red Tops.



**M.S. WARWICK CASTLE. M.S. WINCHESTER CASTLE. M.S. CARNARVON CASTLE.** Union Castle Line. Length, 651 ft. 5 ins., 631 ft. 6 ins., and 630 ft. 7 ins.;  
Gross Tonnage, 20,445, 20,109, and 20,063;  
Funnels : Red, Black Tops.



**ROTTERDAM.** Holland-Amerika. Length, 650 ft. 5 ins.; Gross Tonnage, 24,149;  
Funnels : Buff, with White Band between Two Green.



**ALBERT BALLIN. DEUTSCHLAND.** Hamburg-Amerika Line. Length, 645 ft. 8 ins.;  
Gross Tonnage, 20,131 and 21,046;  
Funnels : Yellow, with Black, White and Red Bands at Tops.



**NEW YORK. HAMBURG.** Hamburg-Amerika Line. Length, 645 ft. 6 ins. ;  
Gross Tonnage, 23,337 and 22,117;  
Funnels : Yellow, with Black, White and Red Bands at Tops.



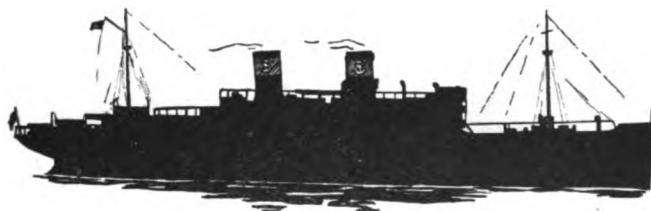
**ALCANTARA. ASTURIAS.** Royal Mail.  
Length, 640 ft.; Gross Tonnage, about 22,000;  
Funnels : Buff.



**DUILIO. GIULIO CESARE.** Italia Line. Length, 635 ft. 6 ins. and 634 ft.;  
Gross Tonnage, 23,635 and 21,900;  
Funnels : White, with Green Stripe and Red Tops.



**ORFORD. ORAMA. ORONSAY. ORONTES. OTRANTO.** Orient. Length, 682 ft.;  
Gross Tonnage, about 20,000;  
Funnels : Cream.



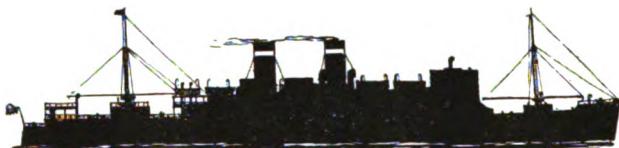
**PRESIDENT HOOVER. PRESIDENT COOLIDGE.** Dollar Steamship Lines.  
Length, 615 ft.; Gross Tonnage, 21,936;  
Funnels : Black, White \$ on Red Band.



**MOULTAN. MALOJA.** Peninsular and Oriental. Length, 600 ft. 8 ins :  
Gross Tonnage, 20,952 and 20,914;  
Funnels : Black.



**M.S. KUNGSHOLM.** Swedish American Line. Length, 594 ft. 9 ins.;  
Gross Tonnage, 20,223; Funnels : Yellow, Blue Discs on Sides.



**VIRGINIA.** **PENNSYLVANIA.** **CALIFORNIA.** American S.S. Corporation.  
Length, 586 ft. 4 ins., 586 ft. 4 ins., and 574 ft. 4 ins.;  
Gross Tonnage, 18,298, 18,200, and 17,833;  
Funnels : Black, White Band.



**VICEROY OF INDIA.** Peninsular and Oriental. Length, 582 ft. 7 ins.;  
Gross Tonnage : 19,627; Funnels : Black.



**DUCHESS OF ATHOLL.** **DUCHESS OF BEDFORD.** **DUCHESS OF RICHMOND.**  
**DUCHESS OF YORK.** Canadian Pacific. Length, 581 ft. 9 ins.;  
Gross Tonnage, 20,123 to 20,021; Funnels : Yellow.



**ORMONDE.** Orient Line. Length, 580 ft. 5 ins.; Gross Tonnage, 14,982;  
Funnels : Cream.



M.S. AORANGI. Canadian-Australasian Line. Length, 580 ft.; Gross Tonnage, 17,491;  
Funnels: Red, Black Tops.



M.S. MARNIX VAN ST. ALDEGONDE. M.S. JOHAN VAN OLDENBARNEVELT.  
Stoomvaart Maatschappij Nederland. Length, 580 ft.;  
Gross Tonnage, 19,129 and 19,040;  
Funnels: Buff, Black Tops.



LAURENTIC. Cunard White Star. Length, 578 ft. 2 ins.; Gross Tonnage, 18,724;  
Funnels: Buff, Black Tops.



DORIC. Cunard White Star. Length, 575 ft. 5 ins.; Gross Tonnage, 18,484;  
Funnels: Buff, Black Tops.

WESTERNLAND. PENNLAND. Red Star. Length, 575 ft. 3 ins.;  
Gross Tonnage, 16,500 and 16,322;  
Funnels: Black, White Band.



SAXON. Union Castle Line. Length, 570 ft. 5 ins.; Gross Tonnage, 12,385;  
Funnels: Red, Black Tops.



**CONTE VERDE.** **CONTE ROSSO.** Italia Line. Length, 570 ft. 2 ins. and 588 ft. 2 ins.; Gross Tonnage, 18,765 and 17,856; Funnels: White, with Green Stripe and Red Tops.



**ARMADALE CASTLE.** **KENILWORTH CASTLE.** Union Castle Line. Length, 570 ft. 1 in.; Gross Tonnage, 12,999 and 12,975; Funnels: Red, Black Tops.



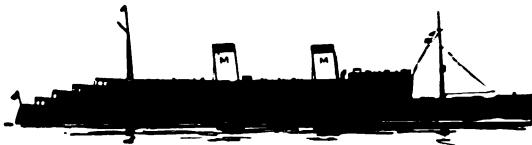
**BALMORAL CASTLE.** **EDINBURGH CASTLE.** Union Castle Line. Length, 570 ft.; Gross Tonnage, 13,363 and 13,329; Funnels: Red, Black Tops.



**M.S. CHICHIBU MARU.** **M.S. TATSUTA MARU.** **M.S. ASAMA MARU.** Nippon Yusen Kaisha. Length, 560 ft.; Gross Tonnage, 17,498 to 16,975; Funnels: Black, Broad White Band, Two Red on White.



**SHINYO MARU.** Nippon Yusen Kaisha. Length, 558 ft.; Gross Tonnage, 13,026; Funnels: Black, Broad White Band, Two Red on White.



**MALOLO.** Matson Line. Length, 554 ft.; Gross Tonnage, 17,282; Funnels: Yellow, Blue Tops, "M" on sides.



**M.S. GRIPSHOLM.** Swedish American Line. Length, 553 ft.; Gross Tonnage, 17,944;  
Funnels: Yellow, Blue Discs on Sides.



**DE GRASSE.** Cie. Générale Transatlantique. Length, 552 ft. 1 in.; Gross Tonnage, 18,435;  
Funnels: Red, Black Tops.



**M.S. REINA DEL PACIFICO.** Pacific Steam Navigation Co.  
Length, 551 ft.; Gross Tonnage, 17,707;  
Funnels: Buff.



**VEENDAM. VOLENDAM.** Holland-Amerika Line. Length, 550 ft. 2 ins.;  
Gross Tonnage, 15,450 and 15,434;  
Funnels: Buff, with White Band between Two Green.



**MONTCALM. MONTCLARE. MONTROSE.** Canadian Pacific.  
Length, 549 ft. 5 ins.; Gross Tonnage, 16,418 to 16,314;  
Funnels: Yellow.



**RANCHI. RAWALPINDI. RANPUR. RAJPUTANA.** Peninsular and Oriental.  
Length, 548 ft.; Gross Tonnage, 16,738 to 16,644;  
Funnels: Black.



**M.S. ST. LOUIS. M.S. MILWAUKEE.** Hamburg-Amerika. Length, 543 ft. 8 ins. and 546 ft. 6 ins.; Gross Tonnage, 16,732 and 16,699; Funnels : Yellow, with Black, White and Red Bands at Tops.



**D'ARTAGNAN.** Messageries Maritimes. Length, 543 ft. 5 ins.; Gross Tonnage, 15,105; Funnels : Black.



**M.S. ARAMIS.** Messageries Maritimes. Length, 543 ft. 5 ins.; Gross Tonnage, 17,537; Funnels : White.



**GELRIA.** Holland Lloyd. Length, 541 ft.; Gross Tonnage, 18,868; Funnels : Yellow, Black Band.



**M.S. VICTORIA.** Lloyd Triestino. Length, 540 ft. 6 ins.; Gross Tonnage, 13,068; Funnels : Yellow.



**MANTUA.** Peninsular and Oriental. Length, 540 ft.; Gross Tonnage, 10,957; Funnels : Black.



**NIEUW ZEELAND. NIEUW HOLLAND.** Koninklijke Paketvaart Maatschappij.  
Length, 540 ft.; Gross Tonnage, 11,060 and 11,057;  
Funnels : Buff, Black Top.



**ORSOVA.** Orient Line. Length, 536 ft. 2 ins.; Gross Tonnage, 12,041;  
Funnels : Cream.



**M.S. FÉLIX ROUSSEL.** Messageries Maritimes. Length, 534 ft. 8 ins.;  
Gross Tonnage, 16,774;  
Funnels : White.



**STAVANGERFJORD.** Norske Amerika Linie. Length, 532 ft. 5 ins.; Gross Tonnage, 13,156;  
Funnels : Yellow, Two Red and Two White Bands with Blue Band between.



**M.S. RANGITATA. RANGITANE. RANGITIKI.** New Zealand Shipping Co.  
Length, 531 ft.; Gross Tonnage, 16,737, 16,712, and 16,698;  
Funnels : Yellow.



**CHITRAL. COMORIN. CATHAY.** Peninsular and Oriental.  
Length, 526 ft. 8 ins., 523 ft. 5 ins., and 523 ft. 5 ins. Gross Tonnage, 15,346, 15,241, and 15,225;  
Funnels : Black.



**NIAGARA.** Canadian-Australasian Line. Length, 524 ft. 7 ins.; Gross Tonnage, 13,415; Funnels: Red, Black Tops.



**M.S. HIGHLAND MONARCH. HIGHLAND CHIEFTAIN. HIGHLAND BRIGADE. HIGHLAND PRINCESS. HIGHLAND PATRIOT.** Royal Mail (Nelson). Length, 523 ft. 4 ins.; Gross Tonnage, 14,157 to 14,128; Funnels: Buff.



**FREDERIK VIII.** Det Forenede Dampskibs Selskab. Length, 523 ft. 5 ins.; Gross Tonnage, 11,850; Funnels: Black, Broad Red Band.



**CORFU. CARTHAGE.** Peninsular and Oriental. Length, 522 ft. 5 ins.; Gross Tonnage, 14,170 and 14,182; Funnels: Black.



**KAISAR-I-HIND.** Peninsular and Oriental. Length, 520 ft.; Gross Tonnage, 11,618; Funnels: Black.



**MINNEDOSA. MELITA.** Canadian Pacific. Length, 520 ft.; Gross Tonnage, 15,186; and 15,183; Funnels: Yellow.



**BERGENSFJORD.** Norske Amerika Line. Length, 512 ft. 4 ins.; Gross Tonnage, 11,015;  
Funnels : Yellow, Two Red and Two White Bands with Blue Band between.



**ARANDORA STAR.** Blue Star Line. Length, 512 ft. 8 ins.; Gross Tonnage, 15,178;  
Funnels : Red, Black Tops and White Band, Blue Star on White Disc.



**AVILA STAR.** **ALMEDA STAR.** **ANDALUCIA STAR.** Blue Star Line.  
Length, 510 ft. 2 ins. to 512 ft. 2 ins.; Gross Tonnage, 12,872 to 12,846;  
Funnels : Red, Black Tops and White Band, Blue Star on White Disc.



**PORTHOS.** Messageries Maritimes. Length, 510 ft. 8 ins.; Gross Tonnage, 12,692;  
Funnels : Black.



**ANDRE LEBOU.** Messageries Maritimes. Length, 508 ft. 2 ins.; Gross Tonnage, 13,682;  
Funnels : Black.



**GUADELOUPE.** Cie. Générale Transatlantique. Length, 508 ft. 4 ins.;  
Gross Tonnage, 10,502;  
Funnels : Red, Black Tops.



**MONOWAI.** Union Royal Mail Line. Length, 500 ft. 4 ins.; Gross Tonnage, 10,852; Funnel: Red, Black Tops.



**M.S. MONTE ROSA.** **M.S. MONTE PASCOAL.** Hamburg-South Amerika Line. Length, 500 ft. 3 in.; Gross Tonnage, 13,882 and 13,870; Funnel: White, Red Tops.



**M.S. GENERAL OSORIO.** Hamburg-Amerika Line. Length, 498 ft. 5 ins.; Gross Tonnage, 11,590; Funnel: Yellow, with Black, White, and Red Bands at Tops.



**ALBERTVILLE.** Lloyd Royal Belge. Length, 494 ft.; Gross Tonnage, 10,769; Funnel: Yellow.



**M.S. LLANGIBBY CASTLE.** Union Castle Line. Length, 486 ft.; Gross Tonnage, 11,951; Funnel: Red, Black Tops.



**M.S. CABO SAN AGUSTIN.** Ybarra & Co. Length, 482 ft. 5 ins.; Gross Tonnage, 11,868; Funnel: Black, White Monogram AV on Sides.



**PATRIA.** Rotterdam Lloyd. Length, 480 ft.; Gross Tonnage, 9,686;  
Funnels: Black.



**SPHINX.** Messageries Maritimes. Length, 478 ft.; Gross Tonnage, 11,375;  
Funnels: Black.



**LEOPOLDVILLE.** Lloyd Royal Belga. Length, 478 ft. 8 ins.;  
Gross Tonnage, 11,256;  
Funnels: Yellow.



**GANGE.** Lloyd Triestino. Length, 477 ft. 5 ins.; Gross Tonnage, 12,272;  
Funnels: Black.



**CUBA.** Cie. Générale Transatlantique. Length, 476 ft.; Gross Tonnage, 11,357  
Funnels: Red, Black Tops.



**FLORIDA.** Société Générale de Transport Maritimes à Vapeur.  
Length, 471 ft. 2½ ins.; Gross Tonnage, 9,140;  
Funnels: Black, Red Band.



**M.S. DUNBAR CASTLE.** Union Castle Line. Length, 471 ft. 2 ins.; Gross Tonnage, 10,002; Funnels: Red, Black Tops.



**M.S. EUROPA.** East Asiatic Co. Length, 465 ft. 4 ins.; Gross Tonnage, 10,224; Funnels: Yellow.



**M.S. AMERIKA.** East Asiatic Co. Length, 465 ft. 4 ins.; Gross Tonnage, 10,110; Funnels: Yellow.



**M.S. JEAN LABORDE.** Messageries Maritimes. Length, 463 ft. 6 ins.; Gross Tonnage, 11,414; Funnels: White.



**M.S. WANGANELLA.** Huddart, Parker. Length, 461 ft. 2 ins.; Gross Tonnage, 9,576; Funnels: Yellow.



**M.S. MAGDALENA. M.S. ORINOCO.** Hamburg-Amerika. Length, 456 ft. 8 ins.; Gross Tonnage, 9,540; Funnels: Yellow, with Black, White, and Red Bands at Tops.



**TILAWA.** **TALMA.** British India S.M. Co. Length, 451 ft.  
Gross Tonnage, 10,006 and 10,000;  
Funnels: Black, Two White Bands.



**FLANDRIA.** **ORANIA.** Holland Lloyd. Length, 450 ft.; Gross Tonnage, 10,171 and 9,763;  
Funnels: Yellow, Black Band.



**M.S. ERIDAN.** Messageries Maritimes. Length, 445 ft. 4 ins.; Gross Tonnage, 9,928;  
Funnels: White.



**DE LA SALLE.** Cie. Générale Transatlantique. Length, 440 ft.; Gross Tonnage, 8,400;  
Funnels: Red, Black Tops.

**SINAIA.** Cyp. Fabre. Length, 440 ft.; Gross Tonnage, 8,567;  
Funnels: Blue Top with White Band under.



**ASIE.** Chargeurs Réunis. Length, 430 ft. 3 ins.; Gross Tonnage, 8,561;  
Funnels: Yellow, Red Stars on White Band.



**M.S. THÉOPHILE GAUTIER.** Messageries Maritimes. Length, 425 ft.;  
Gross Tonnage, 8,194;  
Funnels: White.



**SIMON BOLIVAR.** Royal Nederlands Line. Length, 420 ft.; Gross Tonnage, 7,906; Funnels: Black, Two White Bands.



**M.S. NEPTUN.** **M.S. MERKUR.** Norddeutscher Lloyd. Length, 410 ft.; Gross Tonnage, 5,945; Funnels: Yellow.



**RANGATIRA.** Union Steamship Company of N.Z. Length, 406 ft. 1 in.; Gross Tonnage, 6,152; Funnels: Red, Black Tops and Two Black Rings.



**NAGASAKI MARU.** **SHANGHAI MARU.** Nippon Yusen Kaisha. Length, 402 ft.; Gross Tonnage, 5,272; Funnels: Black, Broad White Band, Two Red on White.



**M.S. VENUS.** Bergen Steamship Co. Length, 398 ft. 5 ins.; Gross Tonnage, 5,407; Funnels: Black, Three White Rings.



**KEIFUKU MARU.** Imperial Japanese Railway. Length, 385 ft.; Gross Tonnage, 5,833; Funnels: Yellow, Black Top, Red  $\times$  on Yellow.



**ANGLIA. CAMBRIA. HIBERNIA. SCOTIA.** London, Midland and Scottish Railway.  
Length, 380 ft. 5 ins.; Gross Tonnage, 3,460;  
Funnels : Yellow, Black Tops.



**VIENNA. AMSTERDAM. PRAGUE.** London and North Eastern Railway.  
Length, 350 ft.; Gross Tonnage, 4,218;  
Funnels ; Yellow, Black Tops.



**DUKE OF ARGYLL. DUKE OF LANCASTER. DUKE OF ROTHESAY.** London, Midland  
and Scottish Railway. Length, 349 ft.; Gross Tonnage, 3,608;  
Funnels : Yellow, Black Tops.



**M.S. ULSTER MONARCH. ULSTER QUEEN. ULSTER PRINCE.** Ulster Imperial Line.  
Length 346 ft.; Gross Tonnage, 3,759;  
Funnels : Red, Black Top.



**ANTWERP. MALINES. BRUGES.** London and North Eastern Railway.  
Length, 321 ft. 6 ins.; Gross Tonnage, 2,957;  
Funnels : Yellow, Black Tops.



**HANTONIA. NORMANNIA.** Southern Railway. Length, 290 ft. 3 ins.;  
Gross Tonnage, 1,567;  
Funnels : Buff, Black Tops.



**CERAMIC.** Shaw, Savill and Albion. Length, 655 ft. 1 in.; Gross Tonnage, 18,495; Funnel: Buff, Black Top.



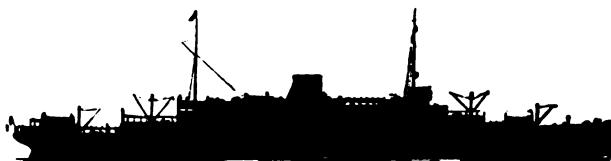
**CHAMPLAIN.** Cie. Générale Transatlantique. Length, 607 ft.; Gross Tonnage, 28,124; Funnel: Red, Black Top.



**CARINTHIA.** **FRANCONIA.** Cunard White Star. Length, 600 ft. 7 ins. and 601 ft. 3 ins.; Gross Tonnage, 20,277 and 20,175; Funnel: Red, with Black Top and Three Black Rings.



**SCYTHIA.** **LACONIA.** **SAMARIA.** Cunard White Star. Length, 601 ft.; Gross Tonnage, 19,761, 19,695, and 19,597; Funnel: Red, with Black Top and Three Black Rings.



**M.S. VULCANIA.** **M.S. SATURNIA.** Italis Line. Length, 631 ft. 4 ins.; Gross Tonnage, 23,970 and 23,940; Funnel: White, with Green Stripe and Red Top.



**M.S. LAFAYETTE.** Cie. Générale Transatlantique. Length, 577 ft. 2 ins.; Gross Tonnage, 25,178; Funnel: Red, Black Top.



**ALMANZORA. ATLANTIS. ARLANZA.** Royal Mail. Length, 570 ft.; Gross tonnage, 15,551 to 14,622; Funnel: Buff.



**ULYSSES. NESTOR.** Blue Funnel Line. Length, 563 ft. 2 ins.; Gross Tonnage, 14,652 and 14,629; Funnel: Blue, Black Top.



**M.S. NEPTUNIA. M.S. OCEANIA.** Italia Line. Length, 589 ft. 7 ins.; Gross Tonnage, 19,475 and 19,507; Funnel: White, with Green Stripe and Red Top.



**TUSCANIA. CALIFORNIA. ANCHOR.** Length, 553 ft.; Gross Tonnage, 16,991 and 16,792; Funnel: Black.



**LANCASTRIA.** Cunard White Star. Length, 552 ft. 8 ins. Gross Tonnage, 16,243 ; Funnel : Red, with Black Top and Three Black Rings.

**CAMERONIA.** Anchor. Length, 552 ft. 4 ins. ; Gross Tonnage, 16,297 ; Funnel : Black.



**MONGOLIA. MOLDAVIA.** Peninsular and Oriental. Length, 551 ft. 6 ins. and 552 ft. 4 ins. ; Gross Tonnage, 16,650 and 16,556 ; Funnel : Black.



**M.S. CHRISTIAAN HUYGENS.** Stoomvaart Maatschappij Nederland. Length, 551 ft. 5 ins. ; Gross Tonnage, 15,704 ; Funnel : Buff, Black Top.



**AKAROA.** Shaw, Savill and Albion. Length, 550 ft. 7 ins. ; Gross Tonnage, 15,128 ; Funnel : Buff, Black Top.



**ORDUNA.** Pacific Steam Navigation Co. Length, 550 ft. 3 ins. ; Gross Tonnage, 15,507 Funnel : Buff.



**ORBITA.** Pacific Steam Navigation Co. Length, 550 ft. 3 ins.; Gross Tonnage, 15,495; Funnel; Buff.



**M.S. BALOERAN.** Rotterdam Lloyd. Length, 550 ft.; Gross Tonnage, 16,981; Funnel: Black.



**M.S. DEMPO.** Rotterdam Lloyd. Length, 550 ft.; Gross Tonnage, 16,979; Funnel: Black.



**BETHORE.** Ore Steamship Co., N.Y. Length, 550 ft.; Gross Tonnage, 8,257; Funnel: Grey, Blue and White Bands, White O.



**M.S. SIR JAMES CLARK ROSS.** Hvalfanger A/S Rosshavet. Length, 537 ft. 9 ins.; Gross Tonnage, 14,362.



**HOBSONS BAY.** LARGS BAY. ESPERANCE BAY. JERVIS BAY. MORETON BAY.  
Aberdeen and Commonwealth Line. Length, 530 ft.; Gross Tonnage, about 14,200;  
Funnel: Yellow.



**OROPESA.** Pacific Steam Navigation Co. Length, 530 ft.; Gross Tonnage, 14,075;  
Funnel: Buff.



**SAN MELITO.** Eagle Oil and Shipping Co. Length, 530 ft.; Gross Tonnage, 12,286;  
Funnel: Black, Yellow Band, Black Eagle, Black O on White Band, Yellow Band.



**CADILLAC.** SARANAC. Anglo-American Oil Co. Length, 530 ft. 2 ins.;  
Gross Tonnage, 12,076 and 12,074;  
Funnel: Red, Black Top.



**M.S. ATHEL CROWN.** United Molasses Co. Length, 526 ft. 5 ins.; Gross Tonnage 11,099;  
Funnel: Red, with U.M.C. in White Diamond, Black Top.



**LETITIA.** ATHENIA. Anchor-Davidson. Length, 525 ft. 7 ins. and 526 ft. 3 ins.;  
Gross Tonnage, 13,475 and 13,465;  
Funnel: Black. White Band.

MERCHANT SHIPS.

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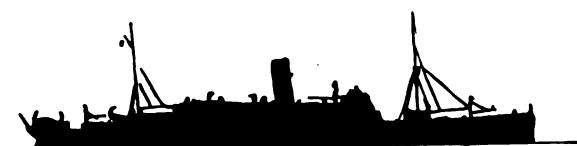
OROYA. Pacific Steam Navigation Co. Length, 525 ft. 3 ins. Gross Tonnage, 12,257; Funnel : Buff.



CALGAROLITE. Imperial Oil Co. Length, 522 ft.; Gross Tonnage, 11,941; Funnel : Black, Blue Band between Two White, Black Top.



M.S. F. H. BEDFORD, JUNR. Baltic Amer. Petrol. Import. Length, 521 ft. 4 ins.; Gross Tonnage, 11,862; Funnel: Black, Red Band with B on White.



ALAUNIA. ASCANIA. AURANIA. Cunard White Star. Length, 520 ft.; Gross Tonnage, 14,080 to 18,984; Funnel ; Red, with Black Top and Three Black Rings.



ANDANIA. AUSONIA. ANTONIA. Cunard White Star. Length, 520 ft.; Gross Tonnage, 13,950 to 18,867; Funnel : Red, with Black Top and Three Black Rings.



BARADINE. BARRABOOL. BALLARAT. BALRANALD. BENDIGO. Peninsular and Oriental. Length, 519 ft. 9 ins.; Gross Tonnage, 13,072 to 12,972; Funnel : Black.



**MANGALORE. MATHURA.** Brocklebank. Length, 518 ft.; Gross Tonnage, 9,784 and 9,745; Funnel: Black, Blue and White Band, Black Top.



**DROTTNINGHOLM.** Swedish American Line. Length, 517 ft.; Gross Tonnage, 11,065; Funnel: Yellow, Blue Disc.



**M.S. HARRY G. SEIDEL.** Baltisch Amer. Petrol. Import. Length, 513 ft. 2 ins.; Gross Tonnage, 11,395. Funnel: Black, Red Band with R on White.



**PRESIDENT ROOSEVELT. PRESIDENT HARDING.** United States Lines. Length, 516 ft. 5 ins.; Gross Tonnage, 13,869; Funnel: Red, White Band, Blue Top.



**M.S. WAIPAWA. M.S. WAIRANGI. M.S. WAIWERA.** Shaw, Savill and Albion. Length, 516 ft.; Gross Tonnage, about 10,700; Funnel: Yellow, Black Top.



**KRALJICA MARIJA.** Jugoslavenski Lloyd. Length, 515 ft. 2 ins. Gross Tonnage, 10,196; Funnel: Blue, Black Top.



**FUSHIMI MARU. SUWA MARU.** Nippon Yusen Kalsha. Length, 513 ft. and 516 ft.; Gross Tonnage, 10,936 and 10,672; Funnel: Black, Broad White Band, Two Red on White.



**M.S. HIKAWA MARU. M.S. HIYE MARU. M.S. HEIAN MARU.** Nippon Yusen Kalsha. Length, 510 ft. to 512 ft. 6 ins.; Gross Tonnage, 11,622 to 11,616; Funnel: Black, Broad White Band, Two Red on White.



**HORORATA.** New Zealand Shipping Co. Length, 511 ft. 1 in.; Gross Tonnage, 9,178; Funnel: Buff.



**PHILOCETES. ACHILLES. TYNDAREUS.** Blue Funnel Line. Length, 511 ft. 9 ins., 507 ft. 4 ins., and 507 ft.; Gross Tonnage, 11,431 to 11,361; Funnel: Blue, Black Top.



**VOLTAIRE. VANDYCK.** Lamport and Holt. Length, 510 ft. 6 ins.; Gross Tonnage, 13,248 and 13,241; Funnel: Blue, White Band, Black Top.



**M.S. VICTOLITE. M.S. VANCOLITE.** Imperial Oil Co. Length, 510 ft. 2 ins.; Gross Tonnage, 11,410 and 11,404; Funnel: Black, Blue Band between Two White, Black Top.



**TAFELBERG.** Kerguelen Sealing and Whaling Co. Length, 508 ft. 3 ins.; Gross Tonnage, 13,640.



**M.S. TERUKUNI MARU.** **M.S. YASUKUNI MARU.** Nippon Yusen Kaisha. Length, 507 ft. and 505 ft.; Gross Tonnage, 11,930; Funnel: Black, Broad White Band, Two Red on White.



**BEAVERFORD.** **BEAVERHILL.** **BEAVERBURN.** **BEAVERBRAE.** **BEAVERDALE.** Canadian Pacific. Length, 503 ft.; Gross Tonnage, 10,042 to 9,956; Funnel: Yellow.



<b>PRESIDENT HAYES.</b>	Dollar Steamship Lines.	Length, 502 ft.;	Gross Tonnage, 10,533;
<b>PRESIDENT MONROE.</b>	"	"	"
<b>PRESIDENT VANBUREN.</b> "	"	"	"
<b>PRESIDENT ADAMS.</b> "	"	"	"
<b>PRESIDENT HARRISON.</b> "	"	"	"
<b>PRESIDENT POLK.</b> "	"	"	"
<b>PRESIDENT GARFIELD.</b> "	"	"	"
Funnel: Black, White \$ on Red Band."			



**PORT MELBOURNE.** **PORT SYDNEY.** Commonwealth and Dominion Line. Length, 501 ft. 3 ins.; Gross Tonnage, 9,142 and 9,130; Funnel: Red, with Black Top and Two Black Rings.



**THEMISTOCLES.** Shaw, Savill and Albion. Length, 500 ft. 6 ins.; Gross Tonnage, 11,231; Funnel: Buff, Black Top.



**LLANSTEPHAN CASTLE.** Union Castle Line. Length, 500 ft. 5 ins.;  
Gross Tonnage, 11,299;  
Funnel : Red, Black Top.



**TAMAROA. MATAROA.** Shaw, Savill and Albion. Length, 500 ft. 4 ins.;  
Gross Tonnage, 12,405 and 12,390;  
Funnel : Buff, Black Top.



**FORDSDALE.** Shaw, Savill and Albion. Length, 500 ft.;  
Gross Tonnage, 9,947;  
Funnel : Buff, Black Top.



**GLENIFFER. CARNARVONSHIRE.** Glen Line. Length, 500 ft.;  
Gross Tonnage, 9,429 and 9,385;  
Funnel : Red, Black Top.



**CRISTOBAL COLON. HABANA.** Compania Transatlantica.  
Length, 499 ft. 4 ins. and 480 ft.; Gross Tonnage, 10,883 and 10,551;  
Funnel : Black.



**MAGDAPUR. MANIPUR.** Brocksbank Line. Length, 499 ft. 6 ins.;  
Gross Tonnage, 9,265 and 9,279;  
Funnel : Black, Blue and White Band, Black Top.



**SIERRA NEVADA.** Hamburg-South Amerika. Length, 499 ft. 5 ins.; Gross Tonnage, 13,589; Funnel: White, Red Top.



**SARPEDON.** **HECTOR.** **ANTENOR.** Blue Funnel Line. Length, 499 ft., 498 ft. 8 ins., 497 ft. 7 ins.; Gross Tonnage, 11,321 to 11,174; Funnel: Blue, Black Top.



**EASTERN PRINCE.** **WESTERN PRINCE.** **NORTHERN PRINCE.** **SOUTHERN PRINCE.** Prince Line. Length, 496 ft. 2 ins.; Gross Tonnage, 10,926 to 10,917; Funnel: Black, Two Red Bands, Prince of Wales Feathers on lower.



**HARUNA MARU.** **HAKONE MARU.** **HAKOZAKI MARU.** **HAKUSAN MARU.** Nippon Yusen Kaisha. Length, 495 ft.; Gross Tonnage, 10,421 to 10,380; Funnel: Black, Broad White Band, Two Red on White.



**M.S. CARIBIA.** **M.S. CORDILLERA.** Hamburg-Amerika. Length, 494 ft.; Gross Tonnage, about 12,000; Funnel: Yellow, with Black, White and Red Bands at Top.



**AENEAS.** **SCANIUS.** **ANCHISES.** Blue Funnel Line. Length, 493 ft.; Gross Tonnage, 10,058 to 10,000; Funnel: Blue, Black Top.



**DIOMED. CALCHAS. PERSEUS. MENELAUS.** Blue Funnel Line.  
Length, 491 ft., 490 ft. 8 ins., 490 ft. 5 ins. and 495 ft. 5 ins.;  
Gross Tonnage, 10,374 to 10,283;  
Funnel: Blue, Black Top.



**M.S. DORSET. M.S. DURHAM.** Federal Steam Navigation Co. Length, 493 ft. 5 ins.;  
Gross Tonnage, about 11,000;  
Funnel: Red, St. George's Flag with Central Blue Squares on Sides, Black Top.



**M.S. DELFTDIJK. M.S. DAMSTERDIJK.** Holland-Amerika. Length, 490 ft. 9 ins.;  
Gross Tonnage, 10,220 and 10,155;  
Funnel: Buff, White Band between Two Green.



**M.S. POELAU BRAS. POELAU LAUT. POELAU ROEBIAH. POELAU TELLO.**  
Stoomvaart Maatschappij Nederland. Length, 490 ft.; Gross Tonnage, 9,250;  
Funnel; Buff, Black Top.



**M.S. BLOEMFONTEIN. M.S. JAGERSFONTEIN.** United Netherlands Navigation Co.  
Length, 487 ft.; Gross Tonnage, about 8,300;  
Funnel: Black, Yellow Band.



**M.S. PORT CHALMERS.** Commonwealth and Dominion. Length, 486 ft. 8 ins.;  
Gross Tonnage, 8,535;  
Funnel: Red, with Black Top and Two Black Rings.



**CITY OF EXETER.** Ellerman City Line. Length, 486 ft. 7 ins.; Gross Tonnage, 9,447; Funnel: Buff, White Band, Black Top.



**SULTAN STAR.** M.S. **TUSCAN STAR.** Blue Star Line. Length, 486 ft. 1 in. and 471 ft.; Gross Tonnage, 12,306 and 11,449; Funnel: Red, Black Top and White Band, Blue Star on White Disc.



**REMUERA.** New Zealand Shipping Co. Length, 485 ft.; Gross Tonnage, 11,383; Funnel: Yellow.



**M.S. GLENGARRY.** M.S. **GLENBEG.** M.S. **GLENAPP.** M.S. **GLENOGLE.** Glen Line. Length, 485 ft.; Gross Tonnage, 9,450 to 9,513; Funnel: Red, Black Top.

**M.S. DINTELDIJK.** M.S. **DRECHTDIJK.** Holland-Amerika. Length, 485 ft.; Gross Tonnage, 9,399 and 9,338; Funnel: Buff, with White Band between Two Green.

**M.S. LOCHKATRINE.** M.S. **LOCHGOIL.** M.S. **LOCHMONAR.** Royal Mail. Length, 485 ft.; Gross Tonnage, 9,600; Funnel: Buff.



**CITY OF PARIS.** Ellerman City Line. Length 484 ft. 7 ins.; Gross Tonnage, 10,902; Funnel: Buff, White Band, Black Top.



**KERGUELEN.** Chargeurs Réunis. Length, 484 ft. 2 ins.; Gross Tonnage, 10,123; Funnel: Yellow, Red Stars on White Band.



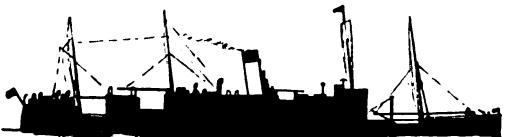
**MAUI.** Matson Line. Length 484 ft.; Gross Tonnage, 9,801;  
Funnel: Yellow, Blue Top, "M" on sides.



**M.S. TARONGA.** Wilh. Wilhelmsen. Length, 484 ft.;  
Gross Tonnage, 7,003;  
Funnel: Black, Two Blue Bands.



**M.S. STAFFORDSHIRE. SHROPSHIRE. CHESHIRE.** Bibby Line.  
Length, 483 ft. 6 ins.; Gross Tonnage, 10,654 to 10,560;  
Funnel: Salmon Pink, Black Top.



**M.S. WORCESTERSHIRE.** Bibby Line. Length, 483 ft.; Gross Tonnage, 11,453  
Funnel: Salmon Pink, Black Top.



<b>FORMOSE</b>	<b>Chargeurs Réunis.</b>	Length, 483 ft. 4 ins.; Gross Tonnage, 9,975;
<b>GROIX.</b>		
<b>BELLE ISLE.</b>	" "	479 ft.;
<b>AURIGNY.</b>	" "	481 ft. 6 ins.;
<b>DESTRADE</b>	{	" " 483 ft. 4 ins.;
<b>EUBEE.</b>	" "	" " 9,598;

Funnel: Yellow, Red Stars on White Band.

**COMPIÈGNE. CHANTILLY.** Messageries Maritimes. Length 478 ft. 5 ins.;  
Gross Tonnage 9,986;  
Funnel: Black.



**M.S. ZEALANDIC. M.S. COPTIC. Shaw, Savill and Albion.** Length, 482 ft. 6 ins.;  
(Gross Tonnage, 8,281);  
Funnel: Buff, Black Top.



**M.S. CABO SAN ANTONIO. M.S. CABO SANTO TOME.** Ybarra & Co.  
Length, 482 ft. 5 ins.; Gross Tonnage, 12,275 and 11,868;  
Funnel: Black, White Monogram AV on Sides.



**YORKSHIRE. LANCASHIRE.** Bibby Line. Length, 482 ft. 4 ins.; Gross Tonnage,  
10,184 and 9,543;  
Funnel: Salmon Pink, Black Top.



**DIPLOMAT.** Harrison Line. Length, 482 ft.; Gross Tonnage, 8,240;  
Funnel: Black, Red Band between Two White.



**URUGUAY.** Compania Transatlantica. Length, 481 ft. 9 ins.; Gross Tonnage, 10,348;  
Funnel: Black.



**PORT ADELAIDE. PORT AUCKLAND. PORT BOWEN. PORT BRISBANE. PORT CAMPBELL. PORT CAROLINE. PORT HARDY. PORT HUNTER. PORT NICHOLSON.** Commonwealth and Dominion Line. Length, 481 ft. 2 ins.;  
Gross Tonnage, 8,267 to 8,516;  
Funnel: Red, with Black Top and Two Black Rings.



**ARGENTINA.** Compania Transatlantica. Length, 480 ft.; Gross Tonnage, 10,137;  
Funnel: Black.



**RUAHINE.** New Zealand Shipping Co. Length, 480 ft. 6 ins.; Gross Tonnage, 10,870; Funnel: Yellow.



**NEURALIA. NEVASA.** British India S.N. Co. Length, 480 ft. 5 ins.; Gross Tonnage, 9,200; Funnel: Black, Two White Bands.



**M.S. INDRAPOERA.** Rotterdam Lloyd. Length, 479 ft. 5 ins.; Gross Tonnage, 10,825; Funnel: Black.



**CITY OF SIMLA.** Ellerman City Line. Length, 476 ft. 7 ins.; Gross Tonnage, 9,468; Funnel: Buff, White Band, Black Top.



**IROQUOIS.** Anglo-American Oil Co. Length, 476 ft. 3 ins.; Gross Tonnage, 9,202; Funnel: Red, Black Top.



**STUART STAR. AFRIC STAR. NAPIER STAR. RODNEY STAR.** Blue Star Line. Length, 475 ft. 8 ins. to 476 ft. 9 ins.; Gross Tonnage, 11,901 to 10,583; Funnel: Red, Black Top and White Band, Blue Star on White Disc.



**M.S. PORT ALMA. M.S. PORT FAIRY. M.S. PORT HUON. M.S. PORT FREMANTLE.  
M.S. PORT GISBORNE.** Commonwealth and Dominion. Length, 477 ft. 3 ins.;  
Gross Tonnage, about 8,000;  
Funnel: Red, with Black Top and Two Black Rings.



**DUNLUCE CASTLE. DURHAM CASTLE. Union Castle.**  
Length, 475 ft. 5 ins.; Gross Tonnage, 8,130;  
Funnel: Red, Black Top.



**ARIZONA MARU. HAWAII MARU. MANILA MARU. AFRICA MARU.**  
Osaka Shosen Kaisha. Length, 475 ft.; Gross Tonnage, 9,618 to 9,414;  
Funnel: Black, Two White Bands, joined at Side.



**DOMINIA. Telegraph Construction and Maintenance Co.** Length, 475 ft.;  
Gross Tonnage, 9,250;  
Funnel: Yellow.



**OXFORDSHIRE. Bibby Line.** Length, 474 ft. 7 ins.; Gross Tonnage, 8,646;  
Funnel: Salmon Pink, Black Top.



**LLANDAFF CASTLE. LLANDOVERY CASTLE. Union Castle Line.**  
Length, 471 ft. 1 in.; Gross Tonnage, 10,786, and 10,609;  
Funnel: Red Black Top.



**HERMINIUS.** Shaw, Savill, and Albion. Length, 477 ft.; Gross Tonnage, 7,852; Funnel: Buff, Black Top.



**M.S. OPAWA.** **M.S. ORARI.** **M.S. OTAIO.** New Zealand Shipping Co. Length, 471 ft., 471 ft. and 472 ft. 2 ins.; Gross Tonnage, 10,107, 10,350 and 10,048; Funnel: Yellow.



**MAHOUT.** **MAHSEER.** **MAHRONDA.** **MAIDAN.** **MAIHAR.** **MALAKAND.** **MANAAR.** **MATHERAN.** Brocklebank. Length, 470 ft. 4 ins.; Gross Tonnage, 7,880 to 7,242; Funnel: Black, Blue and White Band, Black Top.



**MALAKUTA.** **MAHANADA.** Brocklebank. Length, 470 ft. 2 ins.; Gross Tonnage, 7,205; Funnel: Black, Blue and White Band, Black Top.



**CALAMARES.** **PASTORES.** United Fruit Corp. Length, 470 ft. 4 ins.; Gross Tonnage, 7,233 and 7,242; Funnel: Buff, White Diamond on Red Band, Black Top.



**CITY OF NAGPUR.** Ellerman City Line. Length, 469 ft. 9 ins.; Gross Tonnage, 10,138; Funnel: Buff, White Band, Black Top.



**GLOUCESTERSHIRE.** Bibby Line. Length, 467 ft. 2 ins.; Gross Tonnage, 8,252; Funnel: Salmon Pink, Black Top.



**AMARAPOORA.** Henderson Line. Length, 465 ft. 8 ins.; Gross Tonnage, 8,012;  
Funnel : Black.



**MADURA.** **MALDA.** **MANTOLA.** **MATIANA.** **MODASA.** **MULBERA.** British India  
S.N. Co. Length, 465 ft. 2 ins.; Gross Tonnage, about 9,000;  
Funnels : Black, Two White Bands.



**TAJANDOEN.** Stoomvaart Maatschappij Nederland. Length, 465 ft. ;  
Gross Tonnage, 8,159 ;  
Funnel : Buff, Black Top.



**M.S. PORT DUNEDIN.** **M.S. PORT HOBART.** Commonwealth and Dominion Line.  
Length, 465 ft.; Gross Tonnage, 7,500;  
Funnel : Red, with Black Top and Two Black Rings.



**M.S. THURLAND CASTLE.** **M.S. PENRITH CASTLE.** Lancashire Shipping Co.  
Length, 464 ft. 8 ins.; Gross Tonnage, 6,372 and 6,369;  
Funnel : Red, Black Top.



**M.S. BUENOS AIRES MARU.** **M.S. RIO DE JANEIRO MARU.** Osaka Shoden Kaisha.  
Length, 461 ft. 3 ins.; Gross Tonnage, 9,626;  
Funnel : Black, Two White Bands joined at Side.



**TEKOA, TONGARIRO, TURAKINA.** New Zealand Shipping Co. Length, 460 ft. 5 ins.; Gross Tonnage, 8,529 to 8,719; Funnel: Yellow.

**KENT, MIDDLESEX, SURREY.** Federal Steam Nav. Co. Length, 460 ft.; Gross Tonnage, 8,694 to 8,564; Funnel: Red, St. George's Flag with central Blue Square on Sides, Black Top.



**M.S. HEIYO MARU.** Nippon Yusen Kaisha. Length, 460 ft.; Gross Tonnage, 9,816; Funnel: Black, Broad White Band, Two Red on White.



**TAINUI.** Shaw, Savill, and Albion. Length, 477 ft. 8 ins.; Gross Tonnage, 9,965; Funnel: Buff, Black Top.



**M.S. GULFCREST.** Gulf Refining Co. of New York. Length, 460 ft.; Gross Tonnage, 8,952; Funnel: Pink with G in White and Black Top.



**RAJULA.** ROHNA. British India S.M. Co. Length, 460 ft.; Gross Tonnage, 8,478 and 8,602; Funnel: Black, Two White Bands.



**M.S. AAGTEKERK. M.S. ALMKERK.** United Netherlands Navigation Co. Length, 460 ft.; Gross Tonnage, about 6,500; Funnel: Black, Yellow Band.



**AGAPENOR.** **AUTOLYCUS.** **AUTOMEDON.** **DARDANUS.** **ELPENOR.** **EUMAEUS.**  
**GLAUCUS.** **HELENUS.** **LYCAON.** **MACHAON.** **MENTOR.** **MERIONES.** **PHEMIUS.**  
**PYRRHUS.** **RHEXENOR.** **TEIRESIAS.** **TROILUS.** Blue Funnel Line.  
Length, 455 ft. 2 ins.; Gross Tonnage, 7,552 to 7,957;  
Funnel: Blue, Black Top.



**CITY OF LYONS.** Ellerman Line. Length, 455 ft.; Gross Tonnage, 7,063;  
Funnel: Buff, White Band, Black Top.



**COSTA RICA.** Nederland Stoomvaart Maatschappij.  
Length, 455 ft.; Gross Tonnage, 8,672;  
Funnel: Buff, Black Top.



**CLAN MACTAGGART.** **CLAN MACTAVISH.** **Clan Line.** Length, 452 ft. 7 ins.,  
and 469 ft.; Gross Tonnage, 7,622 and 7,631;  
Funnel: Black, Two Red Bands.



**GARTH CASTLE.** **GRANTULLY CASTLE.** **GLoucester CASTLE.** **Union Castle.**  
Length, 452 ft. 6 ins.; Gross Tonnage, about 7,600 to 8,000;  
Funnel: Red, Black Top.



**MANUEL ARNUS.** Compañia Trasatlantica. Length, 435 ft.; Gross Tonnage, 7,578;  
Funnel: Black.



**M.S. SILVERPALM.** **M.S. SILVERWILLOW.** **M.S. SILVERYEW.** Silver Line.  
Length, 450 ft. 9 ins.; Gross Tonnage, 6,373.  
Funnel: White, Blue Band, Blue Top.



**M.S. ACCRA. M.S. APAPA.** Elder Dempster. Length, 450 ft. 7 ins.; Gross Tonnage, 9,337 and 9,333; Funnel: Buff.



**M.S. ABA. M.S. ADDA.** Elder Dempster. Length, 450 ft. 5 ins. and 435 ft. 3 ins.; Gross Tonnage, 7,937 and 7,816; Funnel: Buff.



**M.S. SOMERSETSHIRE. M.S. DORSETSHIRE.** Bibby Line. Length, 450 ft. 3 ins.; Gross Tonnage, 9,648 and 9,645; Funnel: Salmon Pink, Black Top.



**EXCALIBUR. EXETER. EXCAMBION. EXOCHORDA.** American Export Lines. Length, 450 ft.; Gross Tonnage, 9,360. Funnel: Black, White Band between Two Red, E in Blue on the White.



**M.S. DOMALA. M.S. DUMANE.** British India S.N. Co. Length, 450 ft.; Gross Tonnage, about 8,400; Funnel: Black, Two White Bands.



**CITY OF NEW YORK.** American-South African Line. Length, 450 ft.; Gross Tonnage, 8,272. Funnel: Yellow.



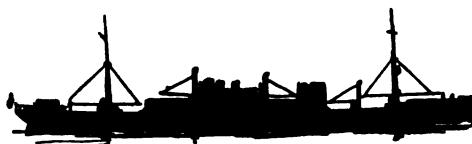
**BRITANNIA.** Anchor Line. Length, 460 ft.; Gross Tonnage, 8,802; Funnel: Black.



**LONDON MARU.** Osaka Shosen Kaisha. Length 450 ft. 1 in.; Gross Tonnage, 7,191; Funnel: Black, Two White Bands joined at Sides.



**MAKURA.** Union Steam Ship Co. of N.Z. Length, 450 ft.; Gross Tonnage, 8,075; Funnel: Red, Black Top.



**M.S. ESQUILINO. M.S. VIMINALE.** Lloyd Triestino. Length, 450 ft. and 467 ft. 5 ins.; Gross Tonnage, 8,657.



**MANCHESTER REGIMENT.** Manchester Liners. Length, 450 ft.; Gross Tonnage, 5,989; Funnel: Red, Black Top, Black Band.



**M.S. DURENDA.** British India S.M. Co. Length, 450 ft.; Gross Tonnage, 7,241; Funnel: Black, Two White Bands.



**NELLORE. NANKIN.** Eastern and Australian Line. Length, 450 ft.; Gross Tonnage, about 7,000; Funnel: Black.



**M.S. KOTA PINANG. M.S. KOTA TJANDI. M.S. KOTA NOPAN. M.S. KOTA AGOENG.**  
Rotterdam Lloyd. Length, 449 ft.; Gross Tonnage, about 7,300;  
Funnel: Black.



**MASIRAH.** Broekbank Line. Length, 448 ft.; Gross Tonnage, 6,578;  
Funnel: Black, Blue and White Band, Black Top.



**ANCHORIA.** Broekbank Line. Length, 446 ft. 4 ins.; Gross Tonnage, 6,112;  
Funnel: Black, Blue and White Band, Black Top.



**M.S. KINAI MARU. M.S. TOKAI MARU. M.S. SANYO MARU. M.S. HOKUROKU MARU.**  
Osaka Shosen Kaisha. Length, 446 ft.; Gross Tonnage, 8,365;  
Funnel: Black, Two White Bands joined at Side.



**MAHRATTA. MAKALLA.** Broekbank Line. Length, 445 ft.; Gross Tonnage, 6,690;  
Funnel: Black, Blue and White Band, Black Top.



**CINGALESE PRINCE.** Furness Rio Capo. Length, 441 ft. 8 ins.; Gross Tonnage, 6,750;  
Funnel: Black, Two Red Bands, Prince of Wales Feathers on lower.



**M.S. CHINESE PRINCE. M.S. JAPANESE PRINCE. M.S. JAVANESE PRINCE.**  
**M.S. MALAYAN PRINCE.** Furness Rio Capo. Length, 441 ft.; Gross Tonnage, 6,734;  
Funnel: Black, Two Red Bands, Prince of Wales Feathers on lower.



**BRITISH MERCHANT.** British Tanker Co. Length, 440 ft. 7 ins.; Gross Tonnage, 6,994; Funnel: Red, White Band, Black Top; Green Band on White.



**ZEELANDIA.** Holland Lloyd. Length, 440 ft. 7 ins.; Gross Tonnage, 7,995; Funnel: Yellow, Black Band.



**M.S. BARBARIGO.** Società Veneziana. Length, 440 ft. 7 ins.; Gross Tonnage, 5,293; Funnel: Black, Red Band between Two White.



**M.S. TJINEGARA.** **M.S. TJISADANE.** Java-China-Japan Line. Length, 440 ft. 6 ins.; Gross Tonnage, 9,227; Funnel: Black.



**ELYSIA.** Anchor Line. Length, 440 ft.; Gross Tonnage, 6,757; Funnel: Black.



**M.S. ERRIA.** East Asiatic Co. Length, 440 ft. 3 ins.; Gross Tonnage, 8,636.



**M.S. PACIFIC RELIANCE.** **M.S. PACIFIC ENTERPRISE.** **M.S. PACIFIC RANGER.** Furness Withy. Length, 435 ft.; Gross Tonnage, 6,570; Funnel: Black, Red, Thin Black and Red Band, Black Top.



**M.S. GLENAMOY.** Glen Line. Length, 435 ft.; Gross Tonnage, 7,269;  
Funnel: Red, Black Top.



**CITY OF NORWICH.** Ellerman (Hall Line). Length, 434 ft. 3 ins.; Gross Tonnage, 6,726  
Funnel: Buff, White Band, Black Top.



**NAGINA.** British India S.N. Co. Length, 433 ft.; Gross Tonnage, 6,651;  
Funnel: Black, Two White Bands.



**TJIBADAK.** Java-China-Japan Line. Length, 433 ft.; Gross Tonnage, 7,803;  
Funnel: Black.



**M.S. DUNSTER GRANGE.** Furness-Houlder. Length, 431 ft. 3 ins.;  
Gross Tonnage, 9,494;  
Funnel: Black, Red Band with White Maltese Cross, Black Top.



**TAKADA.** British India S.N. Co. Length, 430 ft. 1 in.; Gross Tonnage, 6,949;  
Funnel: Black, Two White Bands, Black Top.



**M.S. WESTRALIA.** Huddart Parker. Length, 431 ft. 1 in.; Gross Tonnage, 8,108;  
Funnel: Yellow.



**M.S. LEIGHTON. M.S. LINNELL.** Lamport and Holt. Length, 430 ft.; Gross Tonnage, 7,412;  
Funnel: Light Blue, White Band, Black Top.



**M.S. UPWEY GRANGE. M.S. EL ARGENTINO.** Furness-Houlder.  
Length, 430 ft.; Gross Tonnage, 9,130 and 9,501;  
Funnel: Black, Red Band with White Maltese Cross, Black Top.



**HARDWICKE GRANGE.** Furness-Houlder. Length, 430 ft.; Gross Tonnage, 9,005;  
Funnel: Black, Red Band with White Maltese Cross, Black Top.



**BRITISH INVENTOR.** British Tanker Co. Length, 430 ft.; Gross Tonnage, 7,101;  
Funnel: Red, White Band, Black Top, Green Band on White.



**ANTONIO LOPEZ.** Compañía Transatlántica. Length, 430 ft.; Gross Tonnage, 5,975;  
Funnel: Black.



**MARQUESA. BARONESA. DUQUESA. PRINCESA. CANONESA.** Furness-Houlder.  
Length, 430 ft.; Gross Tonnage, 8,972 to 8,286;  
Funnel: Black, Red Band with White Maltese Cross, Black Top.



**M.S. COLOMBIA.** Royal Nederlands Line. Length, 429 ft. 5 ins.;  
Gross Tonnage, 10,782;  
Funnel: Black, Two White Bands.



**M.S. BUENOS AIRES. M.S. CANADA. M.S. BALBOA.** Axel Axelson Johnson.  
Length, 426 ft. 9 ins.; Gross Tonnage, 5,614 to 5,524;  
Funnel: Black, J in Yellow Star on Blue Band between Two Yellow.



**M.S. IRISBANK.** Bank Line. Length, 426 ft. 7 ins.; Gross Tonnage, 5,626;  
Funnel: Yellow, Black Top.



**BAYANO. CAMITO. CORONADO. ARIGUANI. CARARE. CAVINA.** Elders and  
Fyffes. Length, 425 ft. 5 ins.; Gross Tonnage, 6,611 to 6,907;  
Funnel: Buff, Black Top.



**M.S. ALSIA.** East Asiatic Co. Length, 425 ft. 2 ins.; Gross Tonnage, 5,812.



**M.S. EURYBATES.** Blue Funnel Line. Length, 431 ft. 9 ins.; Gross Tonnage, 6,445;  
Funnel: Blue, Black Top.



**STOCKWELL.** Brocklebank Line. Length, 425 ft.; Gross Tonnage, 5,437;  
Funnel: Black, Blue and White Band, Black Top.



**CAIRNROSS.** Cairn Line. Length, 425 ft.; Gross Tonnage, 5,494;  
Funnel: Red, Two White Bands with White Triangle between, Black Top.



**KARAGOLA.** **KHANDALLA.** British India S.N. Co. Length, 425 ft.; Gross Tonnage, 7,053; Funnel: Black, Two White Bands.



**TUSCARORA.** Anglo American Oil Co. Length, 425 ft.; Gross Tonnage, 7,106; Funnel: Red, Black Top.



**M.S. MEGARA.** **M.S. MIRZA.** Anglo-Saxon Petroleum Co. Length, 423 ft.; Gross Tonnage, 7,992 and 8,004, Funnel: Buff, Black Top.



**MANUEL CALVO.** Compañía Transatlántica. Length, 421 ft.; Gross Tonnage, 5,617; Funnel: Black.



**KAROOLA.** McIlwraith, McEacharn. Length, 420 ft. 5 ins.; Gross Tonnage, 7,301; Funnel: Red, Black Top.



**MARAMA.** Union Steamship Co. of N.Z. Length, 420 ft. 3 ins.; Gross Tonnage, 6,497; Funnel: Red, Black Top.



**SAN SILVESTRE.** **SAN TIRSO.** **SAN VALERIO.** **SAN ZEFERINO.** Eagle Oil and Shipping Co. Length, 420 ft.; Gross Tonnage, 6,226 to 6,433; Funnel: Black, Yellow Band, Black Eagle, Black O on White Band, Yellow Band.

**SAN RICARDO.** Clá. Navigazione San Ricardo.



**ALNMOOR. BLYTHMOOR. CASTLEMOOR.** Moor Line (Runciman).  
Length, 420 ft.; Gross Tonnage, 6,582 and 6,574;  
Funnel: Black, White Band, Blue R.



**PATUCA.** Elders and Fyffes. Length, 417 ft. 2 ins.; Gross Tonnage, 6,103;  
Funnel: Buff, Black Top.



D'ENTRECASTEAUX.	FORBIN. Chargeurs Réunis.	Length, 417 ft.; Gross Tonnage, 7,291;
DUPLEX.	" "	" 7,135;
ANGO.	" "	" 7,110;
BOUGAINVILLE.		" 7,110;

Funnel: Yellow, Red Stars on White Band.



**LADY DRAKE. LADY HAWKINS. LADY NELSON.** Canadian National (West Indies) Steamships. Length, 415 ft.; Gross Tonnage, about 7,900;  
Funnel: Red, White Band, Blue Top.



**LADY RODNEY. LADY SOMERS.** Canadian National Steamships. Length, 415 ft.;  
Gross Tonnage, 8,194;  
Funnel: Red, White Band, Blue Top.



**MUNARGO.** Munson Steamship Co. Length, 415 ft.; Gross Tonnage, 6,484;  
Funnel: Blue, White Band, Black Top.



**BELVEDERE.** Italia Line. Length, 412 ft.; Gross Tonnage, 7,420;  
Funnel: White, with Green Stripe and Red Top.



**FORT ST. GEORGE.** Furness Withy. Length, 411 ft. 8 ins.; Gross Tonnage, 7,785;  
Funnel: Black, Two Red Bands.



**ERINPURA.** British India S.M. Co. Length, 411 ft.; Gross Tonnage, 5,128;  
Funnel: Black, Two White Bands.



**CLAN MACNAB. CLAN MACNAIR. CLAN MACHAUGHTON. CLAN MACNEIL. CLAN MONROE. CLAN MORRISON. CLAN MURDOCH. CLAN MURRAY.** Clan Line.  
Length, 410 ft. 6 ins.; Gross Tonnage, 6,114;  
Funnel: Black, Two Red Bands.



**BUENOS AIRES.** Compañía Transatlántica. Length, 410 ft. 6 ins.; Gross Tonnage, 5,311;  
Funnel: Black.



**MONTEVIDEO.** Compañía Transatlántica. Length, 410 ft. 5 ins.; Gross Tonnage, 5,205;  
Funnel: Black.



**ZEALANDIA.** Huddart, Parker. Length, 410 ft.; Gross Tonnage, 7,000;  
Funnel: Yellow.



**MEDIA.** Brocklebank. Length, 410 ft.; Gross Tonnage, 5,487;  
Funnel: Black, Blue and White Band, Black Top.



**OCEAN PRINCE.** Furness Rio Cape. Length, 410 ft.; Gross Tonnage, 5,217;  
Funnel: Black, Two Red Bands, Prince of Wales Feathers on lower.



**ELLENGA.** British India S.N. Co. Length, 410 ft.; Gross Tonnage, 5,196;  
Funnel: Black, Two White Bands, Black Top.



**DRAMATIST.** Harrison Line. Length, 410 ft.; Gross Tonnage, 5,443;  
Funnel: Black, Red Band between Two White.



**JAMAICA PLANTER.** **JAMAICA SETTLER.** Jamaica Direct Fruit Line.  
Length, 413 ft. and 405 ft.; Gross Tonnage, 7,432 and 7,256;  
Funnel: Blue, Two White Bands, Black Top.



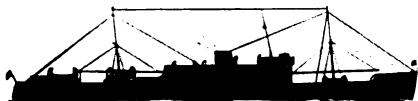
**M.S. LOUISIANA.** Det Forenede Dampskibs Selskab. Length, 407 ft. 8 ins.  
Gross Tonnage, 6,513;  
Funnel: Black, Broad Red Band.



**NEWFOUNDLAND.** **NOVA SCOTIA.** Warren Line (Furness). Length, 405 ft.;  
Gross Tonnage, 6,791 and 6,796;  
Funnel; Black, Two Red Bands, lower Broad, upper Narrow.



**M.S. GLENLUCE.** Glen Line. Length, 405 ft.; Gross Tonnage, 6,754; Funnel: Red, Black Top.



**M.S. INCHANGA.** **M.S. ISIPINGO.** Bank Line. Length, 403 ft.; Gross Tonnage, about 7,100; Funnel: Yellow, Black Top.



**BREDA.** Koninklijke Nederlandsche Stoomboot Mij. Length, 402 ft. 6 ins.; Gross Tonnage, 6,906; Funnel: Black, Two White Bands.



**CAIRNEK.** **CAIRNGLEN.** Cairn Line. Length, 401 ft. 9 ins.; Gross Tonnage, 5,007 and 5,019; Funnel: Red, Two White Bands with White Triangle between, Black Top.



**HALIZONES.** Houston Line. Length, 400 ft. 8 ins.; Gross Tonnage, 5,298; Funnel: Red, Two Black Rings, Black Top.



**MANISTEE.** **PATIA.** **ZENT.** Elders and Fyffes. Length, 400 ft. 2 ins.; Gross Tonnage, 5,360; Funnel: Buff, Black Top.



**BASSA.** **BEREBY.** **BIAFRA.** **BODNANT.** **BOMA.** Elder Dempster. Length, 400 ft.; Gross Tonnage, 5,300; Funnel: Buff,



**M.S. DOLIUS. M.S. MEDON.** Blue Funnel Line. Length, 407 ft.; Gross Tonnage, 5,904 and 5,915; Funnel: Blue, Black Top.



**ORANGEMOOR. FERNMOOR.** Moor Line (Runciman). Length, 399 ft. 6 ins.; Gross Tonnage, 5,775; Funnel: Black, White Band, Blue R.



**CAIRNDHU. CAIRNGOWAN.** Cairn Line. Length, 399 ft. 3 ins., and 400 ft.; Gross Tonnage, 5,250 and 5,295; Funnel: Red, Two White Bands with White Triangle between, Black Top.



**M.S. OLJAREN.** Transatlantic S.S. Co. Length, 389 ft.; Gross Tonnage, 5,482; Funnel: Yellow, Black Top.



**BRITANNIA. SUECIA.** Swedish Lloyd. Length, 375 ft.; Gross Tonnage, 4,500; Funnel: White; Yellow Star on Blue Disc, Black Top.



**M.S. STELLA POLARIS.** Bergen Steamship Co. Length, 360 ft.; Gross Tonnage, 5,020; Funnel: Black, Three White Rings.



**ARCGOW. ARCGWEAR.** Isherwood Arcform Ships. Length, 362 ft.; Gross Tonnage, about 4,000;



M.S. PRINCE BAUDOUIN. Belgian Government. Length, 356 ft.;  
Gross Tonnage, 3,050;  
Funnel: Yellow.



BEN MY CHREE. Isle of Man Steam Packet Co. Length, 355 ft.; Gross Tonnage, 2,586;  
Funnel: Red, Two Black Rings, Black Top.



M.S. MALAITA. Burns, Philip and Co. Length, 335 ft.; Gross Tonnage, 3,300;  
Funnel: Black, Black and White Chequered Bands.



CANTERBURY. Southern Railway. Length, 329 ft.; Gross Tonnage, 2,912;  
Funnel: Buff, Black Top.



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## INDEX.

### A

- Adderstone, S.S., 127  
Admiralty, Board of, 14  
—, Statement of First Lord of, 193–203  
Age of ships, 101, 320  
Air Arm, Fleet, Belgian, 174  
— —, British, 16, 59, 155–166,  
    351–353  
— —, —, Czechoslovakian, 177  
— —, —, French, 39, 189, 356  
— —, —, Greek, 179  
— —, —, Italian, 173, 357  
— —, —, Japanese, 171, 355  
— —, —, Netherlands, 177  
— —, —, Poland, 177  
— —, —, Rumanian, 176  
— —, —, Russian, 176  
— —, —, Spanish, 174  
— —, —, Turkish, 175  
— —, —, United States, 59, 177, 354  
— —, —, Yugoslavian, 175  
Aircraft carriers, 9, 60, 194, 216, 229, 239,  
    251, 296  
— —, plans of :—  
    Great Britain, p31–p33  
    France, p58  
    Japan, p77–p78  
    Sweden, p90  
    United States, p104  
— —, profiles of, p8–p10  
— —, civil, 180–188  
— —, naval, 155–179, 351–357  
“Airspeed” aircraft, 185  
Albanian Navy, 254  
America. See *United States*  
Arcform ships, 123, 134  
Argentine armoured and cruising ships,  
    224, p43–p44, p48–p49  
— destroyers, submarines, etc., 268  
— Navy, 45  
Armoured ships, comparative strength,  
    291–293  
Asta, M.S., 135  
Asturias, S.S., converted from oil-  
    engines, 103, 125  
Atlantic Coast, M.S., 138  
Attachés, Naval, 210  
Australia Star, M.S., 128, 133  
Australian Navy, 22, 222, p41, p42  
Austrian Navy, 254  
Aviation, civil, 180–189  
Avro aircraft, 187

### B

- Barge, welded, 140  
Battleships, comparative strength,  
    291–293  
— lists. See under different countries.  
—, plans of, p25–p29, p45–p50, p65–p67,  
    p73–p76, p87, p90, p92–p98  
—, profiles of, p3–p7  
Bauer-Wach system, 126  
Bencas, S.S., 136  
Benson boiler, 125  
Bloemfontein, M.S., 130, 135  
Boilers and fuel, 124  
— on deck, 136  
Brazilian battleships and cruisers, 225,  
    p8, p46  
— destroyers, submarines, etc., 268  
— Navy, 46  
British aircraft, 16, 59, 155–166, 180–188,  
    351–353  
— — carriers, 9, 60, 216, 296, p8–p9,  
    p16–p33  
— battleships and battlecruisers, 194,  
    214, p3, p25–p29  
— cruisers, 5–8, 50, 194, 199, 217–221,  
    p12–p19, p34–p42  
— destroyers, submarines, etc., 10–12,  
    195, 199–200, 261–267, p21–p22  
— guns, 299–306  
— naval estimates, 204  
— Navy, 1–28, 49–60  
— sloops, 12, 200  
British Coast, M.S., 138  
Bulgarian Navy, 254

### C

- Cadets, entry of, 17  
Campeador, M.Y., 139  
Canadian Navy, 23, 223  
Canteen service, naval, 20  
Cape Barfleur, trawler, 139  
Capital ships, 4, 29, 36, 50  
Chilean battleships and cruisers, 226,  
    p45  
— destroyers, submarines, etc., 269  
— Navy, 46  
Chilled beef, carriage of, 133  
Chinese Navy, 254  
Coal, pulverised, 124  
Coastal motor boats, 58

## INDEX.

Coasting ships, 138

Costs of warships, 5

Criollo Fiel, tanker, 141

Cross-Channel vessels, 130, 136

Cruisers, 5-8, 33, 36, 38-41

—, lists of. See under different countries.  
—, plans of, p34-p42, p51-p57, p61-p64,  
r67-r72, r78-r85, p88, p99-p103

—, profiles of, r11-r19

Cuban Navy, 255

Czechoslovakian aircraft, 177

— Navy, 255

### D

Danish armoured ships, 227

— destroyers, submarines, etc., 269

— Navy, 42

Dartmouth entries, 15

De Havilland aircraft, 187

Destroyers, 9-11, 56

—, lists of. See under different countries.

—, profiles of, r20-r22

Diesel-electric drive, 123, 130, 137, 139,  
140

Disarmament, 1-3, 49-52, 61-73

Dominion Navies, 22-26, 222-223

Dora, M.S., 135

Dorset, M.S., 133

“ Dunkerques,” French battleships, 29

Durham, M.S., 133

### E

Ecuadorian Navy, 255

Engineer promotions, naval, 15

Engines, Bauer-Wach, 126

—, combination system, 108

—, dates in development, 336

—, electric drive, 107

—, oil, 128-130

—, Parsons Simplex Unit, 127

—, reciprocating, 125

—, Stephen, 134

—, turbine, 126-128

—, under construction, 122, 336

—, White, 127

Estimates, naval, British, 204

—, —, French, 37, 208

—, —, German, 40, 208

—, —, Italian, 39, 208

—, —, Norwegian, 43

—, —, Swedish, 44

—, —, Turkish, 45

—, —, United States, 32, 206

Estonian Navy, 42, 255

Exhaust steam turbines, 126

### F

Fast voyages, 335

Fastest ships, 334

Ferry boats, 140

Finnish Navy, 255, p19, p46

Fleet Air Arms. See *Air Arm.*

Fleet, cruises of, in 1934, 26

—, distribution of the, 194

Fleets, comparative strength of, 49-60,  
291-296

—, merchant, standing of world's, 97-110

Food-carrying ships, 128-134

Freights, rates of, 345

French aircraft, 39, 169-171, 356

— carriers, 229, p8

— battleships and cruisers, 228-231, p3,  
p5-p6, p14-p17, p47-p59

— destroyers, submarines, etc., 270-272,  
p20, p22

— guns, 307

— naval estimates, 37, 208

— Navy, 37-39

Fruit-carrying ships, 135

### G

German battleships and cruisers, 232-233,  
p7, p15, p17, p19, p60-p63

— destroyers, 273, p21

— naval estimates, 208

— Navy, 40

Gotaverken system, 127

Government and British shipping, 111-  
120

Greek aircraft, 179

— cruisers, 234, p64

— destroyers, submarines, etc., 273

— Navy, 42

Gulzar, M.Y., 138

Guns, naval, Beardmore, 306

—, —, Bethlehem Steel Co., 313

—, —, Bofors, 310-311

—, —, French, 307

—, —, Italian, 308

—, —, Japanese, 309

—, —, United States, 314

—, —, Vickers-Armstrongs, 299-305

### H

Hai Chen, S.S., 134

Hai Heng, S.S., 134

Haytian Navy, 255

Holland. See *Netherlands*.

Howden-Johnson boiler, 125

Hungarian Navy, 256

Hydrographic Service, 17

### I

Imperial Star, M.S., 128, 133

Indian Navy, 23, 223

Inchanga, M.S., 129, 135

Incomati, M.S., 129, 135

Iron and steel prices, 347

Isherwood Arcform ships, 123, 154

Isipingo, M.S., 128, 135

Italian aircraft, 173, 357

— battleships and cruisers, 235-237, p5,  
p11, p13, p16, p65-p72

## INDEX.

Italian destroyers, submarines, etc., 274—  
 — 275, p21, p22  
 — naval estimates, 208  
 — Navy, 39

### J

Jamaica Producer, S.S., 135  
 Japan and London Naval Treaty, 74–84  
 Japanese aircraft, 171, 355  
 — carriers, 239, p9, p10, p77, p78  
 — battleships and cruisers, 238–241, p3,  
     p4, p19, p73–p83  
 — destroyers, submarines, etc., 276–277,  
     p20–p22  
 — Navy, 35–37, 74–84  
 John Dock, tug, 139  
 Johnson boiler, 125

### L

Largest ships, 327–333  
 Latvian Navy, 256  
 Lieutenant-Commanders, surplus, 15  
 Liner companies' difficulties, 111, 120  
 Lochnevis, M.S., 130, 137  
 Loch Ranza, S.S., 134  
 London Naval Treaty, 49  
 — — — and Japan, 74–84  
 London Trader, S.S., 138

### M

Machinery, mercantile marine, 121–131  
 —, dates in development, 336  
 Maierform ships, 123, 135  
 Manchukuo Navy, 47, 256  
 Maneuvres, naval, in 1934 :—  
     British, 85–88  
     French, 89–91  
     Italian, 91–92  
     Japanese, 94  
     United States, 92–94  
 Manoora, M.S., 129  
 Marines, Royal, 21  
 Marriages, Service, 19  
 Mechanical stokers, 124, 137  
 Medical Branch, Royal Naval, 13  
 Merchant fleets, standing of world's, 97–  
     110  
 — ships, notable, of the year, 132–141  
 Mexican Navy, 256  
 Mona's Queen, S.S., 138  
 Monospar aircraft, 189  
 Motorships, particulars of notable, 338  
 —, statistics of, 100, 106, 320–322  
 Munmorah, collier, 138  
 Museum, National Maritime, 21

### N

Naval attachés, 210  
 — construction, Argentine, 45  
 — —, Brazil, 46  
 — —, British, 1–14, 193  
 — —, Chile, 4  
 — —, China, 254

Naval construction, Colombia, 47  
 — —, Denmark, 42  
 — —, Estonia, 42  
 — —, France, 37–38  
 — —, Germany, 40  
 — —, Greece, 42  
 — —, Italy, 39  
 — —, Japan, 36  
 — —, Manchukuo, 47, 256  
 — —, Netherlands, 42  
 — —, Norway, 43  
 — —, Persia, 47  
 — —, Peru, 257  
 — —, Poland, 43, 257  
 — —, Portugal, 43, 257  
 — —, Russia, 44  
 — —, Spain, 41  
 — —, Sweden, 44  
 — —, Turkey, 45  
 — —, United States, 32–34  
 — —, Yugoslavia, 45  
 — estimates, British, 204  
 — —, French, 37, 208  
 — —, German, 40, 208  
 — —, Italian, 39, 208  
 — —, Norwegian, 43  
 — —, Swedish, 44  
 — —, Turkish, 45  
 — —, United States, 32, 206  
 — officials, British and foreign, 209–210  
 — strength, comparative, 48–60, 291–296  
 Navy, Albanian, 254  
 —, Argentine, 45, 224, 268  
 —, Australian, 22, 222  
 —, Austrian, 254  
 —, Brazilian, 46, 225, 268  
 —, British, 1–28, 49–60, 193–205, 214–  
     222, 261–267  
 —, Bulgarian, 254  
 —, Canadian, 23, 223  
 —, Chilean, 46, 226, 269  
 —, Chinese, 254  
 —, Colombian, 47, 254  
 —, Cuban, 255  
 —, Czechoslovakian, 255  
 —, Danish, 42, 227, 269  
 —, Ecuadorian, 255  
 —, Estonian, 52, 255  
 —, Finnish, 255  
 —, French, 37–39, 228–231, 270–272  
 —, German, 40  
 —, Greek, 42  
 —, Haytian, 255  
 —, Hungarian, 256  
 —, Indian, 23, 223  
 —, Italian, 39  
 —, Japanese, 35–37, 74–84  
 —, Latvian, 256  
 —, Manchukuo, 47, 256  
 —, Mexican, 256  
 —, Netherlands, 42  
 —, New Zealand, 25, 223  
 —, Norwegian, 43  
 —, Paraguayan, 256  
 —, Persian, 47, 256  
 —, Peruvian, 47, 256  
 —, Polish, 43, 257  
 —, Portuguese, 43, 257

## INDEX.

- Navy, Rumanian, 258  
—, Russian, 44  
—, Siamese, 48, 258  
—, South African, 25, 223  
—, Spanish, 41  
—, Swedish, 44  
—, Turkish, 259  
—, United States, 32-35  
—, Uruguayan, 47, 259  
—, Venezuelan, 259  
—, Yugoslavian, 45, 259  
Navy Week, 21  
Netherlands, aircraft, 177  
—, cruising ships, 242, p16, p19, p84-p85  
—, destroyers and submarines, 278  
— Navy, 42  
Newcastle (ex "Minotaur") cruisers, 8, 193  
New Zealand Navy, 25, 223  
New Zealand Star, M.S., 128, 133  
Normandie, S.S., 128  
Norwegian coast defence ships, etc., 243, p19, p86  
— destroyers and submarines, 279  
— Navy, 43
- O
- Ocean distances from British ports, 348  
— going tonnage, 104  
Officials, naval, 209  
Oil-burning ships, 108  
Oil engines, 128  
Ordnance, tables of, 299-314  
Orion, S.S., 127, 132
- P
- Paddle-wheel boats, 130, 140  
Panama Canal traffic, 343-344  
Paraguayan Navy, 256  
Parsons "Simplex" turbine unit, 127  
Pay, rates of, in merchant service, 348  
—, stabilisation of naval, 14  
Persian Navy, 47, 256  
Peruvian Navy, 47, 256  
Physical Training Branch, R.N., 18  
Plans of warships, p25-p104  
Polish aircraft, 177  
— Navy, 43, 257  
Port Chalmers, M.S., 133  
Port Townsville, M.S., 133  
Port Wyndham, M.S., 133  
Portuguese Navy, 43, 257  
Prince Baudouin, M.S., 130, 136  
Princess Maud, S.S., 130, 137  
Profiles, merchant ships, p107-p166  
—, warships, p3-p22  
Promotion, engineers, 15  
—, warrant rank, 19  
Propulsion, improvements in, 123  
—, relative employment of different methods, 106-108, 337  
Pulverised fuel, 124
- Q
- Queen Margaret, M.S., 145  
Queen Mary, S.S., 127, 128, 132
- R
- Reciprocating steam engines, 107, 125  
Recruiting, 22  
Refrigerated motorships, 132  
Robert the Bruce, M.S., 145  
Rock, M.S., 138  
Royal Naval Reserve, 142-152  
Rumanian aircraft, 176  
— Navy, 258  
Russian aircraft, 176  
— battleships and cruisers, 244, p7, p18  
— destroyers and submarines, 272-273  
— Navy, 44
- S
- Sailing ships, 98  
"Scrap and build," 117, 119  
Scraping of merchant ships, 108-110  
Shipping, entrances and clearances, 340-341  
—, Government and British, 111-120  
—, International rationalisation, 120  
Ships, age of, 101, 320  
—, exports of, from Great Britain, 347  
—, fast voyages of, 335  
—, fastest, 334  
—, fuel consumption of, at different efficiencies, 339  
—, laid up, 102, 346  
—, largest, 327-333  
—, launched, 324  
—, lost and broken up, 326  
—, motor, number and tonnage, 320, 321  
—, notable of the year, 132-141  
—, plans of war, p25-p104  
—, profiles of merchant, p107-p166  
—, — war, p3-p22  
—, propulsion, different types of, 337,  
—, running costs of, 337  
—, tank, number and tonnage, 323  
—, under construction, 325  
—, world's, 317-320  
—, British proportion, 317  
—, United States proportion, 317  
Short "Scion" aircraft, 138  
Siamese Navy, 48, 248  
Signal Branch, reorganisation of, 19  
"Simplex" turbine unit, 127  
Sloops, 12  
South African Navy, 25, 223  
Soviet Union. See *Russia*.  
Spanish, aircraft, 174  
—, battleships and cruisers, 246, p7, p12, p13, p16, p87-p89  
—, destroyers and submarines, 280  
—, Navy, 41  
Steel, prices of, 347  
Stokers, mechanical, 124, 137  
Strathmore, S.S., 128  
Submarines, 12  
—, lists. See under different countries.

## INDEX.

Submarines, salvage of, 46  
Subsidy to tramp shipping, 111-120  
Suez Canal traffic, 342  
Swedish coast defence ships, 247, p18,  
  p90-p91  
— destroyers and submarines, 281  
—, Navy, 44

**T**

Tankers, 104-105, 128, 141, 323  
Taronga, M.S., 135  
Tonnage, age of, 101, 320  
—, available for carriage of goods and  
  passengers, 104  
—, idle, 102, 346  
—, launched, 324  
—, lost and broken up, 109, 326  
—, owned by different countries, 99-100,  
  318-322  
—, steam and motor, 100, 322  
—, under construction, 325  
—, world's, 97, 317  
Train ferries, 136  
Training, physical, 18  
Tramp Shipping Administration Com-  
  mittee, 119  
— — Subsidy Committee, 119  
Tugs, 139  
Turbines, 126-128  
Turkish aircraft, 47, 175  
— Navy, 259

**U**

Uckermarck, S.S., 125  
Uniform, changes in naval, 17

United States aircraft, 59, 177, 354  
— — — carriers, 33, 60, 251, p104  
— — — battleships and cruisers, 248-253,  
  p4-p15, p92-p104  
— — — destroyers, submarines, etc., 282-  
  287, p20  
— — — guns, 314  
— — — naval estimates, 32, 206  
— — — Navy, 32-35  
Uruguayan Navy, 47, 259

**V**

Velox boiler, 125  
Venezuelan Navy, 259  
Vickers "Velox" aircraft, 189  
Voyages, fast, 335  
Vulcan coupling, 136

**W**

Waipawa, M.S., 128, 133  
Wairangi, M.S., 128, 133  
Waiwera, M.S., 128, 133  
Warships completed or building, 29-31  
—, plans of, p3-p22  
—, profiles, p25-p104  
Welded vessels, 140  
White engine, 127  
Wilna, M.Y., 139

**Y**

Yugoslavian aircraft, 175  
— Navy, 45, 259

# INDEX TO PROFILES OF WARSHIPS.

(Pages p3 to p22.)

A. = Argentine ; B. = Brazil ; C. = Chile ; Col. = Colombia ; C.A. = Commonwealth of Australia ; D. = Netherlands ; De. = Denmark ; Fin. = Finland ; F. = France ; G.B. = Great Britain ; G. = Greece ; Ger. = Germany ; H. = Holland ; I. = Italy ; J. = Japan ; N. = Norway ; P. = Poland ; Port. = Portugal ; R.A.N. = Royal Australian Navy ; S. = Spain ; S.U. = Soviet Union ; Sw. = Sweden ; U.S.A. = United States of America ; Y.S. = Yugo Slavia.

*b.* battleship ; *b.cr.* battle cruiser ; *cr.* cruiser ; *a.cr.* armoured cruiser ; *air.c.* aircraft carrier ; *air.t.* aircraft tender ; *f.l.* flotilla leader ; *l.cr.* light cruiser ; *cr.m.l.* cruiser minelayer ; *s.cr.* scout cruiser ; *s.cl.cr.* second-class cruiser ; *tr. cr.* training cruiser ; *d.* destroyer ; *t.b.* torpedo boat ; *f.cl.d.* first-class destroyer ; *t.b.d.* torpedo-boat destroyer ; *c.d.* coast defence ship ; *sea-p.c.* seaplane carrier ; *a.s.* armoured ship ; *a.t.* aviation transport ; *m.l. & t.s.* minelaying and training ship.

## A.

A. Bassini, *d.* I., p20  
Abukuma, *l.cr.* J., p12  
Acasta, *d.* G.B., p21  
Achilles, *cr.* G.B., p19  
Adelaide, *cr.* R.A.N., p11  
Admiral Graf Spee, *a.s.* Ger., p7  
Admiral Scheer, *a.s.* Ger., p7  
Admiralty "S" Class, *d.* G.B., p22  
Adventure, *cr.m.l.* G.B., p16  
A. Gallano, *f.l.* S., p20  
Aigle, *f.l.* F., p20  
Akagi, *air.c.* J., p9  
Albatros, *f.l.* F., p20  
Albatross, *d.* Ger., p21.  
Albatross, *sea-p.c.* R.A.N., p8  
Alberico de Barbiano, *cr.* I., p16  
Alberto di Giussano, *cr.* I., p16  
Aldea, *d.* C., p22  
Alessandro Poerio, *d.* I., p22  
Algérie, *cr.* F., p18  
Algérien, *d.* F., p20  
Allen, *d.* U.S.A., p20  
Almirante Brown, *cr.* A., p19  
Almirante Cervera, *cr.* S., p16  
Almirante Latorre, *b.* C., p4  
Almirante Valdés, *f.l.* S., p21  
Amazon, *d.* G.B., p22  
Ambuscade, *d.* G.B., p22  
Amiral Sénes, *f.l.* F., p20  
Andrea Doria, *b.* I., p5  
Annamide, *d.* F., p20  
Antioquia, *d.* Col., p21  
Aoba, *cr.* J., p14  
Aquilone, *d.* I., p22  
Arabe, *d.* F., p20  
Argus, *air.c.* G.B., p10  
Arizona, *b.* U.S.A., p7

Arkansas, *b.* U.S.A., p5  
Armando Diaz, *cr.* I., p16  
Ashigara, *cr.* J., p13  
Astoria, *cr.* U.S.A., p14  
Atago, *cr.* J., p13  
Augusta, *cr.* U.S.A., p15  
Augusto Riboty, *f.l.* I., p21  
Australia, *cr.* C.A., p12  
Aventurier, *d.* F., p22  
Aylwin, *d.* U.S.A., p20

## B.

B. Ricasoli, *d.* I., p22  
Balch, *d.* U.S.A., p20  
Baleno, *d.* I., p22  
Bambara, *d.* F., p20  
Banckert, *d.* H., p21  
Barham, *b.* G.B., p6  
Bartolomeo Colleoni, *cr.* I., p16  
Basque, *d.* F., p20  
Beagle, *d.* G.B., p21  
Béarn, *air.c.* F., p8  
Benham, *d.* U.S.A., p20  
Berwick, *cr.* G.B., p13  
Bison, *f.l.* F., p20  
Bolzano, *cr.* I., p13  
Bordelais, *d.* F., p20  
Borea, *d.* I., p22  
Bourrasque, *d.* F., p20  
Boutonnais, *d.* F., p20  
Brestois, *d.* I., p20  
Bretagne, *b.* F., p5  
Broke, *f.l.* G.B., p21  
Bruce, *f.l.* G.B., p21  
Burza, *d.* P., p20

## C

Caio Duilio, *b.* I., p5  
Cairo, *cr.* G.B., p18  
Calcutta, *cr.* G.B., p18  
Caldas, *d.* Col., p21  
Caledon, *cr.* G.B., p18  
California, *b.* U.S.A., p4  
Calypso, *cr.* G.B., p18

Canberra, *cr.* C.A., p12  
Campbell, *f.l.* G.B., p21  
C. Battisti, *d.* I., p22  
Cape Town, *cr.* G.B., p18  
Caradoc, *cr.* G.B., p18  
Cardiff, *cr.* G.B., p17  
Carlisle, *cr.* G.B., p18  
Carlo Mirabello, *f.l.* I., p21  
Cassard, *f.l.* F., p20  
Cassin, *d.* U.S.A., p20  
Castor, *cr.* G.B., p18  
Celebes, *cr.* D., p19  
Ceres, *cr.* G.B., p17  
Chacal, *f.l.* F., p20

Chester, *cr.* U.S.A., p15  
Chicago, *cr.* U.S.A., p15  
Chokai, *cr.* J., p13  
Cincinnati, *s. cr.* U.S.A., p11  
Clay Trygvason, *m.l. & t.s.* N., p19  
Codrington, *f.l.* G.B., p21  
Colbert, *cr.* F., p14  
Colombo, *cr.* G.B., p18  
Colorado, *b.* U.S.A., p4  
Commandant Teste, *a.t.* F., p8  
Concord, *s.cr.* U.S.A., p11  
Condorcet, *b.* F., p3  
Confienza, *d.* I., p22  
Constance, *cr.* G.B., p18  
Conte di Cavour, *b.* I., p5  
Conyngham, *d.* U.S.A., p20  
Cornwall, *cr.* G.B., p12  
Coudouriotis, *d.* G., p22  
Courageous, *air.c.* G.B., p9  
Courbet, *b.* F., p5  
Coventry, *cr.* G.B., p17  
Crusader, *d.* G.B., p21  
Cumberland, *cr.* G.B., p12  
Cummings, *d.* U.S.A., p20  
Curacao, *cr.* G.B., p17  
Curlew, *cr.* G.B., p17  
Cushing, *d.* U.S.A., p20  
Cyclone, *d.* F., p20

## D.

Danae, *cr.* G.B., p17  
Dao, *d.* Port., p21

## INDEX TO PROFILES OF WARSHIPS.

- | <b>D.</b>                              | <b>G.</b>                                     | <b>K.</b>                              |
|--|---|--|
| Dardo, <i>d.</i> I., p22               |   | Kabyle, <i>d.</i> F., p20              |
| Dauntless, <i>cr.</i> G.B., p17        | Gen. A. Cantore, <i>d.</i> I., p20            | Kaga, <i>air.c.</i> J., p10            |
| Davis, <i>d.</i> U.S.A., p20           | Gen. A. Cascino, <i>d.</i> I., p20            | Kato, <i>cr.</i> J., p14               |
| Defender, <i>d.</i> G.B., p21          | Gen. A. Papa, <i>d.</i> I., p20               | Karlsruhe, <i>l.cr.</i> Ger., p15      |
| Delhi, <i>cr.</i> G.B., p17            | Gen. A. Shinotto, <i>d.</i> I., p20           | Kamikaze, <i>f.cl.d.</i> J., p21       |
| De Ruyter, <i>d.</i> H., p21           | Gen. C. Montanari, <i>d.</i> I., p20          | Kaya, <i>s.cl.d.</i> J., p22           |
| Despatch, <i>cr.</i> G.B., p17         | Gen. M. Prestinari, <i>d.</i> I., p20         | Keith, <i>f.l.</i> G.B., p21           |
| Detroit, <i>s.</i> <i>U.S.A.</i> , p11 | Gerfaut, <i>f.l.</i> F., p20                  | Kempenfelt, <i>f.l.</i> G.B., p21      |
| Deutschland, <i>a.s.</i> Ger., p7      | G. Carini, <i>d.</i> I., p20                  | Kent, <i>cr.</i> G.B., p12             |
| Devonshire, <i>cr.</i> G.B., p12       | G. Medici, <i>d.</i> I., p20                  | Keppel, <i>f.l.</i> G.B., p21          |
| Diderot, <i>b.</i> F., p3              | Giovanni della Bande Nere, <i>cr.</i> I., p16 | Kersaint, <i>f.l.</i> F., p20          |
| Diomedè, <i>cr.</i> G.B., p17          | G. Acerbi, <i>d.</i> I., p20                  | Kinu, <i>l.cr.</i> J., p12             |
| D. Manin, <i>d.</i> I., p22            | Giulio Cesare, <i>b.</i> I., p5               | Kinugasa, <i>cr.</i> J., p14           |
| Dorestshire, <i>cr.</i> G.B., p12      | G. la Farina, <i>d.</i> I., p20               | Kirishima, <i>b.</i> J., p4            |
| Douglas, <i>f.l.</i> G.B., p21         | G. la Masa, <i>d.</i> I., p20                 | Kiso, <i>l.cr.</i> J., p12             |
| Downes, <i>d.</i> U.S.A., p20          | G. Nicotera, <i>d.</i> I., p22                | Kitakami, <i>l.cr.</i> J., p12         |
| Dragen, <i>f.cl.t.b.</i> De., p22      | G. Sirtori, <i>d.</i> I., p20                 | Klas Horn, <i>d.</i> Sw., p22          |
| Dragon, <i>cr.</i> G.B., p17           | Glentin, <i>f.cl.t.b.</i> De., p22            | Klas Uggla, <i>d.</i> Sw., p22         |
| Dubrovnik, <i>f.l.</i> Y.S., p20       | Glorious, <i>air.c.</i> G.B., p9              | Köln, <i>l.cr.</i> Ger., p15           |
| Duguay-Trouin, <i>cr.</i> F., p17      | Gorizia, <i>cr.</i> I., p13                   | Kondor, <i>d.</i> Ger., p21            |
| Duncan, <i>d.</i> U.S.A., p20          | Gotland, <i>air.c.</i> Sw., p8                | Kongo, <i>b.</i> J., p4                |
| Duncan, <i>f.l.</i> G.B., p21          | Greif, <i>d.</i> Ger., p21                    | Konigsberg, <i>l.cr.</i> Ger., p15     |
| Dunedin, <i>cr.</i> G.B., p17          | Guépard, <i>f.l.</i> F., p20                  | Kortenaer, <i>d.</i> H., p21           |
| Dunkerque, <i>b.</i> F., p6            | Guglielmo Pepe, <i>d.</i> I., p22             | Krasni Kavkaz, <i>cr.</i> S.U., p18    |
| Dupleix, <i>cr.</i> F., p14            | Gustav V, <i>c.d.</i> Sw., p18                | Kuma, <i>l.cr.</i> J., p12             |
| Duquesne, <i>cr.</i> F., p14           |   |  |
| Durban, <i>cr.</i> G.B., p17           |   |  |
|  |   |  |
| <b>E.</b>                              | <b>H.</b>                                     | <b>L.</b>                              |
| Eagle, <i>air.c.</i> G.B., p8          | Haguro, <i>cr.</i> J., p13                    | L'Alcyon, <i>d.</i> F., p20            |
| E. Cosenz, <i>d.</i> I., p20           | Haruna, <i>b.</i> J., p4                      | L'Ardroit, <i>d.</i> F., p20           |
| Effingham, <i>cr.</i> G.B., p14        | Hawkins, <i>cr.</i> G.B., p14                 | La Motte Piquet, <i>cr.</i> F., p17    |
| Ehrensköld, <i>d.</i> Sw., p22         | Helle, <i>cr.</i> G., p18                     | Lampo, <i>d.</i> I., p22               |
| Emden, <i>l.cr.</i> Ger., p17          | Hermes, <i>air.c.</i> G.B., p8                | Langley, <i>air.c.</i> U.S.A., p10     |
| Emerald, <i>cr.</i> G.B., p12          | Hirado, <i>cr.</i> J., p11                    | La Palme, <i>d.</i> F., p20            |
| Emilé Bertin, <i>cr.m.l.</i> F., p15   | Hogen, <i>f.cl.t.b.</i> De., p22              | La Raillouse, <i>d.</i> F., p20        |
| Enseigne Gabolde, <i>d.</i> F., p20    | Hood, <i>b.cr.</i> G.B., p3                   | La Rioja, <i>f.l.</i> A., p21          |
| Enseigne Roux, <i>d.</i> F., p20       | Hosho, <i>air.c.</i> J., p9                   | Laxen, <i>f.cl.t.b.</i> Den., p22      |
| Enterprise, <i>cr.</i> G.B., p12       | Houston, <i>cr.</i> U.S.A., p15               | Leander, <i>cr.</i> G.B., p19          |
| Espero, <i>d.</i> I., p22              | Hova, <i>d.</i> F., p20                       | Le Chevalier-Paul, <i>f.l.</i> F., p20 |
| Ericsson, <i>d.</i> U.S.A., p20        | Hvalen, <i>f.cl.t.b.</i> De., p22             | Le Fortune, <i>d.</i> F., p20          |
| Euro, <i>d.</i> I., p22                | Hyatt, <i>d.</i> C., p22                      | Le Mars, <i>d.</i> F., p20             |
| Evertsen, <i>d.</i> H., p21            | Hydra, <i>d.</i> G., p22                      | Leipzig, <i>l.cr.</i> Ger., p19        |
| Exeter, <i>cr.</i> G.B., p15           | Hyuga, <i>b.</i> J., p4                       | Leone, <i>f.l.</i> I., p21             |
| Exmouth, <i>f.l.</i> G.B., p22         |   | Leopard, <i>d.</i> Ger., p21           |
|  |   | Leopard, <i>f.l.</i> F., p20           |
| <b>F.</b>                              | <b>I.</b>                                     | <b>M.</b>                              |
| Falke, <i>d.</i> Ger., p21             | Idaho, <i>b.</i> U.S.A., p7                   | Lexington, <i>air.c.</i> U.S.A., p9    |
| Fiume, <i>cr.</i> I., p13              | Ilmarinen, <i>a.s.</i> Fin., p19              | Libertad, <i>cr.</i> S., p16           |
| Foch, <i>cr.</i> F., p14               | Iltis, <i>d.</i> Ger., p21                    | Lima, <i>d.</i> Port., p21             |
| Folgore, <i>d.</i> I., p22             | Indianapolis, <i>cr.</i> U.S.A., p14          | Lion, <i>f.l.</i> F., p20              |
| F. Stocco, <i>d.</i> I., p20           | Intégrale, <i>d.</i> F., p22                  | London, <i>cr.</i> G.B., p12           |
| F. Crispi, <i>d.</i> I., p22           | Ise, <i>b.</i> J., p4                         | Lorraine, <i>b.</i> F., p5             |
| F. Nullo, <i>d.</i> I., p22            | Isudzu, <i>l.cr.</i> J., p12                  | Louisville, <i>cr.</i> U.S.A., p15     |
| Forbin, <i>d.</i> F., p20              |   | Luchs, <i>d.</i> Ger., p21             |
| Foudroyant, <i>d.</i> F., p20          |   | Luigi Cadorna, <i>cr.</i> I., p16      |
| Fougueux, <i>d.</i> F., p20            |   | Lynx, <i>f.l.</i> F., p20              |
| Freccia, <i>d.</i> I., p22             |   |  |
| Frobisher, <i>cr.</i> G.B., p14        | Jaguar, <i>f.l.</i> F., p20                   |  |
| Frondeur, <i>d.</i> F., p20            | Jaguar, <i>d.</i> Ger., p21                   |  |
| Fubuki, <i>f.cl.d.</i> J., p20         | Jaime I, <i>b.</i> S., p7                     |  |
| Fulmine, <i>d.</i> I., p22             | Java, <i>cr.</i> D., p16                      |  |
| Furious, <i>air.c.</i> G.B., p9        | Jean Bart, <i>b.</i> F., p5                   |  |
| Furutaka, <i>cr.</i> J., p14           | Jeanne d'Arc, <i>tr.cr.</i> F., p15           |  |
| Fuso, <i>b.</i> J., p4                 | Jintsu, <i>cr.</i> J., p11                    |  |

## INDEX TO PROFILES OF WARSHIPS.

- M**
- Marblehead, *s.cr.* U.S.A., p11
  - Marocain, *d.* F., p20
  - Martino, *d.* I., p22
  - Maryland, *b.* U.S.A., p4
  - Maya, *cr.* J., p13
  - McDougal, *d.* U.S.A., p20
  - MécanicienPrincipal Lestin, *d.* F., p20
  - Memphis, *s.cr.* U.S.A., p11
  - Mendez Nunez, *l.cr.* S., p12
  - Mendoza, *f.l.* A., p21
  - Miguel de Cervantes, *cr.* S., p16
  - Milwaukee, *s.cr.* U.S.A., p11
  - Minas Geraes, *b.* B., p6
  - Minekase, *f.cl.d.* J., p21
  - Minneapolis, *cr.* U.S.A., p14
  - Mississippi, *b.* U.S.A., p7
  - Mistral, *d.* F., p20
  - Montrose, *f.l.* G.B., p21
  - Moreno, *b.* A., p5
  - Möwe, *d.* Ger., p21
  - Mutsu, *b.* J., p3
  - Mutsuki, *f.cl.d.* J., p21
  - Myoko, *cr.* J., p13
- N.**
- Nachi, *cr.* J., p13
  - Nagara, *l.cr.* J., p12
  - Nagato, *b.* J., p3
  - Naka, *cr.* J., p11
  - Natori, *l.cr.* J., p12
  - Nelson, *b.* G.B., p6
  - Nembo, *d.* I., p22
  - Neptune, *cr.* G.B., p19
  - Nevada, *b.* U.S.A., p7
  - New Mexico, *b.* U.S.A., p7
  - New Orleans, *cr.* U.S.A., p14
  - New York, *b.* U.S.A., p6
  - N. Fabrizi, *d.* I., p20
  - Nicholson, *d.* U.S.A., p20
  - Nicolooso Da Recco, *f.l.* I., p21
  - N. Sauro, *d.* I., p22
  - Nordenskjold, *d.* Sw., p22
  - Norfolk, *cr.* G.B., p12
  - Northampton, *cr.* U.S.A., p15
- O.**
- Oi, *l.cr.* J., p12
  - Oklahoma, *b.* U.S.A., p7
  - O'Brian, *d.* U.S.A., p20
  - Omaha, *s.cr.* U.S.A., p11
  - Opiniâtre, *d.* F., p20
  - Orage, *d.* F., p20
  - Orella, *d.* C., p22
  - Orion, *cr.* G.B., p19
  - Ormen, *f.cl.t.b.* De., p22
  - Oscar II, *b.* Sw., p3
  - Ostro, *d.* I., p22
  - Ouragan, *d.* F., p20
- P**
- Palestro, *d.* I., p22
  - Pantera, *f.l.* I., p21
  - Panthère, *f.l.* F., p20
  - Paris, *b.* F., p5
  - Paris Commune, *b.* S.U., p7
  - Parker, *d.* U.S.A., p20
  - Pennsylvania, *b.* U.S.A., p7
  - Pensacola, *cr.* U.S.A., p15
  - Piet Hein, *d.* H., p21
  - Pluton, *cr.m.l.* F., p17
  - Porter, *d.* U.S.A., p20
  - Portland, *cr.* U.S.A., p14
  - Pola, *cr.* I., p13
  - Primauguet, *cr.* F., p17
  - Provence, *b.* F., p5
  - Psara, *d.* G., p22
- Q.**
- Quarto, *s.cr.* I., p13
  - Queen Elizabeth, *b.* G.B., p6
  - Q. Sella, *d.* I., p22
- R.**
- Raleigh, *s.cr.* U.S.A., p11
  - Ramillics, *b.* G.B., p6
  - Ranger, *air.c.* U.S.A., p10
  - Renown, *b.cr.* G.B., p3
  - Republica, *l.cr.* S., p13
  - Repulse, *b.cr.* G.B., p3
  - Resolution, *b.* G.B., p6
  - Revenge, *b.* G.B., p6
  - Richmond, *s.cr.* U.S.A., p11
  - Riquelme, *d.* C., p22
  - Rivadavia, *b.* A., p5
  - Rodney, *b.* G.B., p6
  - Rowan, *d.* U.S.A., p20
  - Royal Oak, *b.* G.B., p6
  - Royal Sovereign, *b.* G.B., p6
  - Ryujo, *air.c.* J., p10
- S.**
- Saetta, *d.* I., p22
  - Sampson, *d.* U.S.A., p20
  - Sakalave, *d.* F., p20
  - Salt Lake City, *cr.* U.S.A., p15
  - San Francisco, *cr.* U.S.A., p14
  - San Giorgio, *a.cr.* I., p11
  - San Marco, *a.cr.* I., p11
  - San Solferino, *d.* I., p22
  - São Paulo, *b.* B., p6
  - Saratoga, *air.c.* U.S.A., p9
  - Seeadler, *d.* Ger., p21
  - Sendai, *cr.* J., p11
  - Senégalaïs, *d.* F., p20
  - Serrano, *d.* C., p22
  - Shakespeare, *f.l.* G.B., p21
  - Shaw, *d.* U.S.A., p20
  - Shropshire, *cr.* G.B., p12
  - Simoun, *d.* F., p20
  - Sirocco, *d.* F., p20
- T.**
- Takao, *cr.* J., p13
  - Tama, *l.cr.* J., p12
  - Taranto, *l.cr.* I., p11
  - Tartu, *f.l.* F., p 20
  - Tatsuta, *l.cr.* J., p12
  - Téméraire, *d.* F., p20
  - Tempête, *d.* F., p20
  - Tennessee, *b.* U.S.A., p4
  - Tenyru, *l.cr.* J., p12
  - Texas, *b.* U.S.A., p6
  - Tiger, *d.* Ger., p21
  - Tigre, *f.l.* I., p21
  - Tigre, *f.l.* F., p20
  - Tonkinos, *d.* F., p20
  - Tornade, *d.* F., p20
  - Touareg, *d.* F., p20
  - Tourville, *cr.* F., p14
  - Tramontane, *d.* F., p20
  - Trento, *cr.* I., p16
  - Trenton, *s.cr.* U.S.A., p11
  - Trieste, *cr.* I., p16
  - Trombe, *d.* F., p20
  - Tucuman, *f.l.* A., p21
  - Tucker, *d.* U.S.A., p20
  - Turbine, *d.* I., p22
  - Tuscaloosa, *cr.* U.S.A., p14
  - Typhon, *d.* F., p20
- V.**
- Valentine, *d.* G.B., p21
  - Valhalla, *d.* G.B., p21
  - Valiant, *b.* G.B., p6
  - Valkyrie, *d.* G.B., p21
  - Valmy, *f.l.* F., p20
  - Valorous, *d.* G.B., p21
  - Vampire, *d.* G.B., p21
  - Vainämöinen, *a.s.* Fin., p19
  - Vanessa, *d.* G.B., p21
  - Van Galen, *d.* H., p21
  - Vanity, *d.* G.B., p21
  - Van Nes, *d.* H., p21
  - Vanoc, *d.* G.B., p21
  - Vanquisher, *d.* G.B., p21
  - Vauban, *f.l.* F., p20
  - Vauquelin, *f.l.* F., p20
  - Vautour, *f.l.* F., p20
  - Vectis, *d.* G.B., p21
  - Vega, *d.* G.B., p21
  - Velox, *d.* G.B., p21
  - Vendetta, *d.* G.B., p21
  - Venezia, *d.* G.B., p21
  - Venturous, *d.* G.B., p21
  - Verdun, *d.* G.B., p21

INDEX TO PROFILES OF WARSHIPS.

- |   |                                     |                                   |
|---|-------------------------------------|-----------------------------------|
| Verdun, <i>f.l.</i> F., p20               | Wakatake, <i>s.cl.d.</i> J., p22    | Witch, <i>d.</i> G.B., p21        |
| Versatile, <i>d.</i> G.B., p21            | Wakeful, <i>d.</i> G.B., p21        | Witherington, <i>d.</i> G.B., p21 |
| Vesper, <i>d.</i> G.B., p21               | Walker, <i>d.</i> G.B., p21         | Witte de With, <i>d.</i> H., p21  |
| Viceroy, <i>d.</i> G.B., p21              | Wallace, <i>f.l.</i> G.B., p21      | Wivern, <i>d.</i> G.B., p21       |
| Vidella, <i>d.</i> C., p22                | Walpole, <i>d.</i> G.B., p21        | Wolf, <i>d.</i> Ger., p21         |
| Vidette, <i>d.</i> G.B., p21              | Walrus, <i>d.</i> G.B., p21         | Wolfhound, <i>d.</i> G.B., p21    |
| Vimiera, <i>d.</i> G.B., p21              | Warspite, <i>b.</i> G.B., p6        | Wolsey, <i>d.</i> G.B., p21       |
| Vimy, <i>d.</i> G.B., p21                 | Warwick, <i>d.</i> G.B., p21        | Wolverine, <i>d.</i> G.B., p21    |
| V. Orsini, <i>d.</i> I., p20              | Watchman, <i>d.</i> G.B., p21       | Woolston, <i>d.</i> G.B., p21     |
| Vindictive, <i>cr.</i> G.B., p14          | Waterhen, <i>d.</i> G.B., p21       | Worcester, <i>d.</i> G.B., p21    |
| Vinticinco de Maio, <i>cr.</i> A.,<br>p19 | Wessex, <i>d.</i> G.B., p21         | Wrestler, <i>d.</i> G.B., p21     |
| Violent, <i>d.</i> G.B., p21              | Westcott, <i>d.</i> G.B., p21       | Wryneck, <i>d.</i> G.B., p21      |
| Viscount, <i>d.</i> G.B., p21             | Westminster, <i>d.</i> G.B., p21    |                                   |
| Vivacious, <i>d.</i> G.B., p21            | West Virginia, <i>b.</i> U.S.A., p4 |                                   |
| Vivien, <i>d.</i> G.B., p21               | Whirlwind, <i>d.</i> G.B., p21      |                                   |
| Voltaire, <i>b.</i> F., p3                | Whitehall, <i>d.</i> G.B., p21      |                                   |
| Vortigern, <i>d.</i> G.B., p21            | Whitley, <i>d.</i> G.B., p21        |                                   |
| Vouga, <i>d.</i> Port., p21               | Whitshead, <i>d.</i> G.B., p21      |                                   |
| Voyager, <i>d.</i> G.B., p21              | Wicher, <i>d.</i> P., p20           |                                   |
|   | Wild Swan, <i>d.</i> G.B., p21      |                                   |
|   | Wilkes, <i>d.</i> U.S.A., p20       |                                   |
|   | Winchelsea, <i>d.</i> G.B., p21     |                                   |
|   | Winchester, <i>d.</i> G.B., p21     |                                   |
|   | Winslow, <i>d.</i> U.S.A., p20      |                                   |
|   | Wishart, <i>d.</i> G.B., p21        |                                   |
- W.
- Y.
- Z.

Wadsworth, *d.* U.S.A., p 20  
Wainwright, *d.* U.S.A., p20

Zara, *cr.* I., p13  
Zeffiro, *d.* I., p22

## INDEX TO PLANS OF WARSHIPS (Pages P25 to P104).

A. = Argentine ; B. = Brazil ; C. = Chile ; C.A. = Commonwealth of Australia ; D. = Netherlands ; F. = France ; Fin. = Finland ; G.B. = Great Britain ; G. = Greece ; Ger. = Germany ; I. = Italy ; J. = Japan ; N. = Norway ; R.A.N. = Royal Australian Navy ; S. = Spain ; Sw. = Sweden ; U.S.A. = United States of America ; H. = Holland.

*b.* battleship ; *b.cr.* battle cruiser ; *cr.* cruiser ; *a.cr.* armoured cruiser ; *a.s.* armoured ships ; *a.t.* aviation transport ; *air.c.* aircraft carrier ; *f.l.* flotilla leader ; *l.cr.* light cruiser ; *cr.m.l.* cruiser mine layer ; *sea-p.c.* seaplane carrier ; *s.cr.* scout cruiser ; *s.cl.cr.* second-class cruiser ; *d.* destroyer ; *t.b.d.* torpedo-boat destroyer ; *c.d.* coast defence ship ; *m.l.&t.s.* =mine layer and training ship ; *air. cr.* =aircraft cruiser.

- |  |  |   |
|--|--|---|
| <b>A.</b>                                | <b>C.</b>                                    | <b>D.</b>                                     |
| Abukuma, <i>l.cr.</i> J., p83            | Caledon, <i>cr.</i> G.B., p42                | Drottning Victoria, <i>c.d.</i>               |
| Achilles, <i>cr.</i> G.B., p35           | California, <i>b.</i> U.S.A., p93            | Sw., p91                                      |
| Adelaide, <i>cr.</i> R.A.N., p41         | Calypso, <i>cr.</i> G.B., p42                | Duguay-Trouin, <i>cr.</i> F., p54             |
| Admiral Graf Spee, <i>a.s.</i> Ger., p60 | Canberra, <i>cr.</i> R.A.N., p37             | Dunedin, <i>cr.</i> D. cl. G.B., p41          |
| Admiral Scheer, <i>a.s.</i> Ger., p60    | Cape Town, <i>cr.</i> G.B., p42              | Dunkerque, <i>b.</i> F., p47                  |
| Adventure, <i>cr.m.l.</i> G.B., p40      | Caradoc, <i>cr.</i> G.B., p42                | Dupleix, <i>cr.</i> F., p52                   |
| Akagi, <i>air.c.</i> J., p77             | Cardiff, <i>cr.</i> G.B., p42                | Duquesne, <i>cr.</i> F., p52                  |
| Albatross, <i>sea-p.c.</i> R.A.N., p40   | Carlisle, <i>cr.</i> G.B., p42               | Durban, <i>cr.</i> D. cl. G.B., p41           |
| Alberico di Barbiano, <i>cr.</i> I., p71 | Celebes, <i>cr.</i> D., p85                  |   |
| Alberto di Guissano, <i>cr.</i> I., p71  | Ceres, <i>cr.</i> G.B., p42                  | E.  |
| Algerie, <i>cr.</i> F., p53              | Chester, <i>cr.</i> U.S.A., p99              | Eagle, <i>air.c.</i> G.B., p32                |
| Almirante Brown, <i>cr.</i> A., p44      | Chicago, <i>cr.</i> U.S.A., p99              | Effingham, <i>cr.</i> G.B., p39               |
| Almirante Cervera, <i>cr.</i> S., p88    | Chokai, <i>cr.</i> J., p79                   | Eidsvold, <i>c.d.</i> N., p86                 |
| Almirante Latorre, <i>b.</i> C., p45     | Cincinnati, <i>s.cr.</i> U.S.A., p101        | Emden, <i>l.cr.</i> Ger., p63                 |
| Andrea Doria, <i>b.</i> I., p65          | Clav Trygvason, <i>m.l.&amp;t.s.</i> N., p86 | Emerald, <i>cr.</i> G.B., p38                 |
| Aoba, <i>cr.</i> J., p80                 | Colbert, <i>cr.</i> F., p52                  | Emile Bertin, <i>cr.m.l.</i> F., p57          |
| Arizona, <i>b.</i> U.S.A., p96           | Colombo, <i>cr.</i> G.B., p42                | Enterprise, <i>cr.</i> G.B., p38              |
| Arkansas, <i>b.</i> U.S.A., p98          | Colorado, <i>b.</i> U.S.A., p92              | Exeter, <i>cr.</i> G.B. p36                   |
| Armando Diaz, <i>cr.</i> I., p71         | Commandant Teste, <i>a.t.</i> F., p59        |   |
| Ashigara, <i>cr.</i> J., p79             | Concord, <i>s.cr.</i> U.S.A., p101           | <b>F.</b>                                     |
| Astoria, <i>cr.</i> U.S.A., p103         | Condorcet, <i>b.</i> F., p50                 | Fiume, <i>cr.</i> I., p69                     |
| Atago, <i>cr.</i> J., p79                | Conte di Cavour, <i>b.</i> I., p66           | Foch, <i>cr.</i> F., p52                      |
| Augusta, <i>cr.</i> U.S.A., p99          | Cornwall, <i>cr.</i> G.B., p37               | Frobisher, <i>cr.</i> G.B., p39               |
| Australia, <i>cr.</i> R.A.N., p37        | Courageous, <i>air.c.</i> G.B., p30          | Furious, <i>air.c.</i> G.B., p31              |
|  | Courbet, <i>b.</i> F., p49                   | Furutaka, <i>cr.</i> J., p81                  |
| <b>B.</b>                                | Coventry, <i>cr.</i> G.B., p42               | Fuso, <i>b.</i> H., p78                       |
| Barham, <i>b.</i> G.B., p27              | Cumberland, <i>cr.</i> G.B., p37             | Fuzo, <i>b.</i> J., p75                       |
| Bartolomeo Colleoni, <i>cr.</i> I., p71  | Curacao, <i>cr.</i> G.B., p42                |   |
| Bearn, <i>air.c.</i> F., p58             | Curlew, <i>cr.</i> G.B., p42                 | <b>G.</b>                                     |
| Berwick, <i>cr.</i> G.B., p37            |  | Giorgios Averoff, <i>a.cr.</i> G., p64        |
| Bolzano, <i>cr.</i> I., p68              | <b>D.</b>                                    | Giovanni della Bande Nere, <i>cr.</i> I., p71 |
| Bretagne, <i>b.</i> F., p48              | Danae, <i>cr.</i> D. cl. G.B., p41           | Giulio Cesare, <i>b.</i> I., p66              |
| Brindisi, <i>l.cr.</i> , p72             | Dauntless, <i>cr.</i> D. cl. G.B., p41       | Glorious, <i>air.c.</i> G.B., p30             |
|  | Delhi, <i>cr.</i> D. cl. G.B., p41           | Gorizia, <i>cr.</i> I., p69                   |
| <b>C.</b>                                | Despatch, <i>cr.</i> D. cl. G.B., p41        | Gotland, <i>air.cr.</i> Sw., p90              |
| Caio Duilio, <i>b.</i> I., p65           | Detroit, <i>s.cr.</i> U.S.A., p101           | Gustav V, <i>c.d.</i> Sw., p91                |
| Cairo, <i>cr.</i> G.B., p42              | Deutschland, <i>a.s.</i> Ger., p60           |   |
| Calcutta, <i>cr.</i> G.B., p42           | Devonshire, <i>cr.</i> G.B., p34             | <b>H.</b>                                     |
- Haguro, *cr.* J., p79  
 Haruna, *b.* J., p76  
 Hawkins, *cr.* G.B., p39  
 Helle, *cr.* G., p64  
 Hermes, *air.* G.B., p33  
 Hertog Hendrik, *c.d.* D., p84

## INDEX TO PLANS OF WARSHIPS.

- Hood, *b.cr.* G.B., p28  
 Hosho, *air.c.* J., p78  
 Houston, *cr.* U.S.A., p99  
 Hyuga, *b.* J., p74
- I.  
 Idaho, *b.U.S.A.*, p94  
 Ilmarinen, *a.s.* Fin., p46  
 Indianapolis, *cr.* U.S.A., p102  
 Ise, *b.* J., p74  
 Isudzu, *l.cr.* J., p83
- J.  
 Jaime I, *b.* S., p87  
 Java, *cr.* D., p84  
 Jean Bart, *b.* F., p49  
 Jeanne d'Arc, *tr.cr.* F., p55  
 Jintsu, *l.cr.* J., p82
- K.  
 Kako, *cr.* J., p81  
 Karlsruhe, *l.cr.* Ger., p61  
 Kent, *cr.* G.B., p37  
 Kinu, *l.cr.* J., p83  
 Kinugasa, *cr.* J., p80  
 Kirishima, *b.* J., p76  
 Kiso, *l.cr.* J., p83  
 Kitakami, *l.cr.* J., p83  
 Köln, *l.cr.* Ger., p61  
 Kongo, *b.* J., p76  
 Königsberg, *l.cr.* Ger., p61  
 Kuma, *l.cr.* J., p83
- L.  
 La Motte Piquet, *cr.* F., p54  
 Leander, *cr.* G.B., p35  
 Leipzig, *l.cr.* Ger., p62  
 Lexington, *air.c.* U.S.A., p104  
 Libertad, *cr.* S., p88  
 London, *cr.* G.B., p34  
 Lorraine, *b.* F., p48  
 Louisville, *cr.* U.S.A., p99  
 Luigi Cadorna, *cr.* I., p71
- M.  
 25 Maio, *cr.* A., p44  
 Malaya, *b.* G.B., p27  
 Marblehead, *s.cr.* U.S.A., p101  
 Marten Tromp, *c.d.* D., p84  
 Maryland, *b.* U.S.A., p92  
 Maya, *cr.* J., p79  
 Memphis, *s.cr.* U.S.A., p101  
 Mendez Nuñez, *l.cr.* S., p89  
 Miguel de Cervantes, *cr.* S., p88
- Milwaukee, *s.cr.* U.S.A., p101  
 Minas Geraes, *b.* B., p46  
 Minneapolis, *cr.* U.S.A., p103  
 Mississippi, *b.* U.S.A., p94  
 Moreno, *b.* A., p43  
 Mutsu, *b.* J., p73  
 Myoko, *cr.* J., p79
- N.  
 Nachi, *cr.* J., p79  
 Nagara, *l.cr.* J., p83  
 Nagato, *b.* J., p73  
 Naka, *l.cr.* J., p82  
 Natori, *l.cr.* J., p83  
 Nelson, *b.* G.B., p25  
 Neptune, *cr.* G.B., p35  
 Nevada, *b.* U.S.A., p95  
 New Mexico, *b.* U.S.A., p94  
 New Orleans, *cr.* U.S.A., p103  
 New York, *b.* U.S.A., p97  
 Norfolk, *cr.* G.B., p34  
 Norge, *c.d.* N., p86  
 Northampton, *cr.* U.S.A., p99
- O.  
 Oi, *l.cr.* J., p83  
 Oklahoma, *b.* U.S.A., p95  
 Omaha, *s.cr.* U.S.A., p101  
 Orion, *cr.* G.B., p35  
 Oscar II, *b.* Sw., p90
- P.  
 Paris, *b.* F., p49  
 Pennsylvania, *b.* U.S.A., p96  
 Pensacola, *cr.* U.S.A., p100  
 Pisa, *a.cr.* I., p67  
 Pluton, *cr.m.l.* F., p56  
 Pola, *cr.* I., p69  
 Portland, *cr.* U.S.A., p102  
 Primauguet, *cr.* F., p54  
 Provence, *b.* F., p48
- Q.  
 Quarto, *l.cr.* I., p72  
 Queen Elizabeth, *b.* G.B., p27
- R.  
 Raleigh, *s.cr.* U.S.A., p101  
 Ramillies, *b.* G.B., p26  
 Renown, *b.cr.* G.B., p29  
 Republica, *l.cr.* S., p89  
 Repulse, *b.cr.* G.B., p29  
 Resolution, *b.* G.B., p26  
 Revenge, *b.* G.B., p26  
 Richmond, *s.cr.* U.S.A., p101
- S.  
 Salt Lake City, *cr.* U.S.A., p100  
 San Francisco, *cr.* U.S.A., p103  
 São Paulo, *b.* B., p46  
 Saratoga, *air.c.* U.S.A., p104  
 S. Giorgio, *a.cr.* I., p67  
 S. Marco, *a.cr.* I., p67  
 Sendai, *l.cr.* J., p82  
 Shropshire, *cr.* G.B., p34  
 Suffolk, *cr.* G.B., p37  
 Suffren, *cr.* F., p52  
 Sumatra, *cr.* D., p84  
 Sussex, *cr.* G.B., p34  
 Sverige, *c.d.* Sw., p91
- T.  
 Takao, *cr.* J., p79  
 Tama, *l.cr.* J., p83  
 Tatsuta, *l.cr.* J., p83  
 Tennessee, *b.* U.S.A., p93  
 Tenryu, *l.cr.* J., p83  
 Texas, *b.* U.S.A., p97  
 Thionville, *l.cr.* F., p56  
 Tourville, *cr.* F., p52  
 Trento, *cr.* I., p70  
 Trenton, *s.cr.* U.S.A., p101  
 Trieste, *cr.* I., p70  
 Tuscaloosa, *cr.* U.S.A., p103
- V.  
 Väinämöinen, *a.s.* Fin., p46  
 Valiant, *b.* G.B., p27  
 Venezia, *l.cr.* I., p72  
 Vindictive, *cr.* G.B., p39  
 Voltaire, *b.* F., p50
- W.  
 Waldeck Rousseau, *a.cr.* F., p51  
 Warspite, *b.* G.B., p27  
 West Virginia, *b.* U.S.A., p92
- Y.  
 Yamashiro, *b.* J., p75  
 York, *cr.* G.B., p36  
 Yubari, *l.cr.* J., p78  
 Yura, *l.cr.* J., p83
- Z.  
 Zara, *cr.* I., p69

## INDEX TO PROFILES OF MERCHANT SHIPS.

(See Pages P107 to P166.)

- A.  
Aagtekerk, p151  
Aba, p153  
Accra, p153  
Achilles, p139  
Adda, p153  
Aeneas, p142  
Africa Maru, p148  
Afric Star, p147  
Agapenor, p152  
Akaroa, p134  
Alaunia, p137  
Albert Ballin, p116  
Albertville, p126  
Alcantara, p117  
Almanzora, p133  
Almeda Star, p125  
Almkerk, p151  
Alnmoor, p161  
Alisia, p159  
Amarapoora, p150  
Amerika, p128  
Amsterdam, p131  
Anchises, p142  
Anchoria, p155  
Andalucia Star, p125  
Andania, p137  
André Lebon, p125  
Anglia, p131  
Ango, p161  
Antenor, p142  
Antonia, p137  
Antonio Lopez, p158  
Antwerp, p131  
Aorangi, p119  
Apapa, p153  
Aquitania, p107  
Aramis, p122  
Arandora Star, p125  
Argow, p165  
Arcwear, p165  
Argentina, p146  
Ariguani, p159  
Arizona Maru, p148  
Arlanza, p133  
Armadale Castle, p120  
Arundel Castle, r107  
Asama Maru, p120  
Ascania, p137  
Ascanius, p142  
Asie, p129  
Asturias, p117  
Athelcrown, p136  
Athenia, p136  
Atlantis, p133  
Augustus, p115  
Aurigny, p145  
Autolycus, p152
- B.  
Aurania, p137  
Ausonia, p137  
Automedon, p152  
Avila Star, p125
- Balboa, p159  
Ballarat, p137  
Balmoral Castle, p120  
Baloeran, p135  
Balranald, p137  
Baradine, p137  
Barbarigo, p156  
Baronesa, p158  
Barrabool, p137  
Bassa, p164  
Bayano, p159  
Beaverbrae, p140  
Beaverburn, p140  
Beaverdale, p140  
Beaverford, p140  
Beaverhill, p140  
Belgenland, p110  
Belle Isle, p145  
Belvedere, p162  
Bendigo, p137  
Ben-my-Chree, p166  
Bereby, p164  
Berengaria, p100  
Bergensfjord, p125  
Bethore, p135  
Biafra, p164  
Bloemfontein, p143  
Blythmoor, p161  
Bodnant, p164  
Boma p164  
Bougainville, p161  
Breda, p164  
Bremen, p114  
Britannia (Anchor), p153  
Britannia (Swedish Lloyd), p165  
Britannic, p115  
British Inventor, p158  
British Merchant, p156  
Bruges, p131  
Buenos Aires (Axel Axelson Johnson), p159  
Buenos Aires (Cia. Trans-atlantica), p162  
Buenos Aires Maru, p150
- C.  
Cabo San Antonio, p146  
Cabo San Agustin, p126
- Cabo Santo Tome, p146  
Cadillac, p136  
Cairndhu, p165  
Cairnesk, p164  
Cairnglen, p164  
Cairngowan, p165  
Cairnross, p159  
Calamaras, p149  
Calchas, p143  
Caledonia, p112  
Calgarolite, p137  
California (Anchor), p133  
California (American S.S. Corporation), p118  
Cambria, p131  
Cameronia, p134  
Camito, p159  
Canada, p159  
Canonesa, p158  
Canterbury, p. 166  
Cap Arcona, p111  
Cap Polonio, p. 111  
Carare, p159  
Caribia, p142  
Carinthia, p132  
Carnarvon Castle, p116  
Carnarvonshire, p141  
Carthage, p124  
Castlemoor, p161  
Cathay, p123  
Cavina, p159  
Ceramic, p132  
Champlain, p132  
Champollion, p113  
Chantilly, p145  
Cheshire, p145  
Chichibu Maru, p120  
Chinese Prince, p155  
Chitral, p123  
Christiaan Huygens, p134  
Cingalese Prince, p155  
City of Exeter, p144  
City of Lyons, p152  
City of Nagpur, p149  
City of New York, p153  
City of Norwich, p157  
City of Paris, p144  
City of Simla, p147  
Ciudad de Buenos Aires, p113  
Ciudad de Monte Video, p112  
Clan Macnab, p162  
Clan Macnair, p162  
Clan Macnaughton, p162  
Clan Macneil, p162  
Clan Mactaggart, p152  
Clan Mactavish, p152  
Clan Monroe, p162

## INDEX TO PROFILES OF MERCHANT SHIPS.

- C.**  
 Clan Morrison, p162  
 Clan Murdoch, p162  
 Clan Murray, p162  
 Colombia, p158  
 Columbus, p114  
 Comorin, p123  
 Compiègne, p145  
 Conte Biancamano, p116  
 Conte di Savoia, p114  
 Conte Grande, p116  
 Conte Rosso, p120  
 Conte Verde, p120  
 Coptic, p145  
 Cordillera, p142  
 Corfu, p124  
 Coronado, p159  
 Costa Rica, p152  
 Cristobal Colon, p141  
 Cuba, p127
- D.**  
 D'Artagnan, p122  
 Damsterdijk, p143  
 Dardanus, p152  
 De Grasse, p121  
 De La Salle, p129  
 Delftdijk, p143  
 Dempo, p135  
 D'Entrecasteaux, p161  
 Destrade, p145  
 Deutschland, p116  
 Dinteldijk, p144  
 Diomed, p143  
 Diplomat, p146  
 Dolius, p165  
 Domala, p153  
 Dominia, p148  
 Doric, p119  
 Dorset, p143  
 Dorsetshire, p153  
 Dramatist, p163  
 Drechtdijk, p144  
 Drottningholm, p138  
 Duchess of Atholl, p118  
 Duchess of Bedford, p118  
 Duchess of Richmond, p118  
 Duchess of York, p118  
 Duilio, p117  
 Duke of Argyll, p131  
 Duke of Lancaster, p131  
 Duke of Rothesay, p131  
 Dumane, p153  
 Dunbar Castle, p128  
 Dunluce Castle, p148  
 Dunster Grange, p157  
 Dupleix, p161  
 Duquesa, p158  
 Durenda, p154  
 Durham, p143  
 Durham Castle, p148
- E.**  
 Eastern Prince, p142  
 Edinburgh Castle, p120
- F.**  
 Félix Roussel, p123  
 Fernmoor, p165  
 F. H. Bedford, Junr., p137  
 Flandria, p129  
 Florida, p127  
 Fordsdale, p141  
 Forbin, p161  
 Formose, p145  
 Fort St. George, p162  
 Franconia, p132  
 Frederik VIII, p124  
 Fushimi Maru, p139
- G.**  
 Gange, p127  
 Garth Castle, p152  
 Gelria, p122  
 General Osorio, p126  
 George Washington, p115  
 Georgio, p115  
 Giulio Cesare, p117  
 Glanapp, p144  
 Glaucus, p152  
 Glenamoy, p157  
 Glenbeg, p144  
 Glengarry, p144  
 Gleniffer, p141  
 Glenluce, p164  
 Glenogle, p144  
 Gloucester Castle, p152  
 Gloucestershire, p149  
 Grantully Castle, p152  
 Gripsholm, p121  
 Groix, p145  
 Guadeloupe, p125  
 Gulfcrest, p151
- H.**  
 El Argentino, p158  
 Ellenga, p163  
 Elpenor, p152  
 Elysia, p156  
 Empress of Asia, p112  
 Empress of Australia, p111  
 Empress of Britain, p110  
 Empress of Canada, p111  
 Empress of Japan, p110  
 Empress of Russia, p112  
 Eridan, p129  
 Erinpura, p162  
 Erria, p156  
 Esperance Bay, p136  
 Esquiline, p154  
 Eubee, p145  
 Eumaeus, p. 152  
 Europa (N.D.L.), p114  
 Europa (East As.), p128  
 Eurybates, p159  
 Excalibur, p153  
 Excambion, p153  
 Exeter, p153  
 Exochorda, p153
- I.**  
 Ile de France, p109  
 Inchanga, p164  
 Indrapoera, p147  
 Irisbank, p159  
 Iroquois, p147  
 Isipingo, p164
- J.**  
 Jagersfontein, p143  
 Jamaica Planter, p163  
 Jamaica Settler, p163  
 Japanese Prince, p155  
 Javanese Prince, p155  
 Jean Laborde, p128  
 Jervis Bay, p136  
 Johan van Oldenbarneveldt, p119
- K.**  
 Kaisar-i-Hind, p124  
 Karagola, p160  
 Karoola, p160  
 Keifuku Maru, p130  
 Kenilworth Castle, p120  
 Kent, p151  
 Kerguelen, p144  
 Khandalla, p160  
 Kinai Maru, p155  
 Kota Agoeng, p155  
 Kota Pinang, p155

## INDEX TO PROFILES OF MERCHANT SHIPS.

- |   |
|---|
| <p>Kota Tjandi, p155<br/>         Kota Nopan, p155<br/>         Kraljica Marija, p138<br/>         Kungsholm, p118</p> <p><b>L.</b></p> <p>Laconia, p132<br/>         Lady Drake, p161<br/>         Lady Hawkins, p161<br/>         Lady Nelson, p161<br/>         Lady Rodney, p161<br/>         Lady Somers, p161<br/>         Lafayette, p133<br/>         Lancashire, p146<br/>         Lancastria, p134<br/>         Largs Bay, p136<br/>         L'Atlantique, p110<br/>         Laurentic, p119<br/>         Leighton, p158<br/>         Leopoldville, p127<br/>         Letitia, p136<br/>         Leviathan, p109<br/>         Linnell, p158<br/>         Llandaff Castle, p148<br/>         Llandovery Castle, p148<br/>         Llangibby Castle, p126<br/>         Llanstephan Castle, p141<br/>         Lochgoil, p144<br/>         Lochkatrine, p144<br/>         Lochmonar, p144<br/>         London Maru, p154<br/>         Louisiana, p163<br/>         Lutetia, p112<br/>         Lycaon, p152</p> <p><b>M</b></p> <p>Machaon, p152<br/>         Madura, p150<br/>         Magdalena, p128<br/>         Magdapur, p141<br/>         Mahanada, p149<br/>         Mahout, p149<br/>         Mahratta, p155<br/>         Mahronda, p149<br/>         Mahseer, p149<br/>         Maidan, p149<br/>         Maihar, p149<br/>         Majestic, p109<br/>         Makalla, p155<br/>         Makura, p154<br/>         Malaita, p166<br/>         Malakand, p149<br/>         Malakuta, p149<br/>         Malayan Prince, p155<br/>         Malfa, p150<br/>         Malines, p131<br/>         Maloja, p117<br/>         Malolo, p120<br/>         Manaar, p149<br/>         Manchester Regiment, p154<br/>         Manhattan, p115<br/>         Mangalore, p138<br/>         Manila Maru, p148<br/>         Manipur, p141</p> <p><b>N.</b></p> <p>Manistee, p164<br/>         Mantola, p150<br/>         Mantua, p122<br/>         Manuel Arnus, p152<br/>         Manuel Calvo, p160<br/>         Marama, p160<br/>         Mariette Pacha, p113<br/>         Marnix van St. Aldegonde, p119<br/>         Marquesa, p158<br/>         Masirah, p155<br/>         Massilia, p112<br/>         Mataroa, p141<br/>         Matheran, p149<br/>         Mathura, p138<br/>         Matiana, p150<br/>         Maui, p145<br/>         Mauretania, p107<br/>         Media, p163<br/>         Medon, p165<br/>         Megara, p160<br/>         Melita, p124<br/>         Menelaus, p143<br/>         Mentor, p152<br/>         Meriones, p152<br/>         Merkur, p130<br/>         Middlesex, p151<br/>         Milwaukee, p122<br/>         Minnedosa, p124<br/>         Mirza, p160<br/>         Modasa, p150<br/>         Moldavia, p134<br/>         Monarch of Bermuda, p112<br/>         Mongolia, p134<br/>         Monowai, p126<br/>         Montcalm, p121<br/>         Montclare, p121<br/>         Monte Pascoal, p126<br/>         Monte Rosa, p126<br/>         Montevideo, p162<br/>         Montrose, p121<br/>         Mooltan, p117<br/>         Moreton Bay, p136<br/>         Mulbera, p150<br/>         Munargo, p161</p> <p><b>O.</b></p> <p>Northern Prince, p142<br/>         Nova Scotia, p163</p> <p><b>P.</b></p> <p>Pacific Enterprise, p156<br/>         Pacific Ranger, p156<br/>         Pacific Reliance, p156<br/>         Paris, p109<br/>         Pastores, p149<br/>         Patia, p164<br/>         Patria, p127<br/>         Patuca, p161<br/>         Pennland, p119<br/>         Pennsylvania, p118<br/>         Penrith Castle, p150<br/>         Perseus, p143<br/>         Phemius, p152<br/>         Philoctetes, p139<br/>         Poelau Bras, p143<br/>         Poelau Laut, p143<br/>         Poelau Roebiah, p143<br/>         Poelau Tello, p143<br/>         Port Adelaide, p146<br/>         Port Alma, p148<br/>         Port Auckland, p146<br/>         Port Bowen, p146<br/>         Port Brisbane, p146<br/>         Port Campbell, p146<br/>         Port Caroline, p146<br/>         Port Chalmers, p143<br/>         Port Dunedin, p150<br/>         Port Fairy, p148<br/>         Port Fremantle, p148<br/>         Port Gisborne, p148<br/>         Port Hardy, p146<br/>         Port Hobart, p150<br/>         Port Hunter, p146<br/>         Port Huon, p148<br/>         Port Melbourne, p140<br/>         Port Nicholson, p146</p> |
|---|

## INDEX TO PROFILES OF MERCHANT SHIPS.

Port Sydney, p140	San Valerio, p160	Troilus, p152
Porthos, p125	San Zeferino, p160	Turakina, p151
Prague, p131	Sanyo Maru, p155	Tuscania, p133
President Adams, p140	Saranac, p136	Tuscan Star, p144
President Coolidge, p117	Sarpedon, p142	Tuscarora, p160
President Garfield, p140	Saturnia, p132	Tyndareus, p139
President Harding, p138	Saxon, p119	
President Harrison, p140	Scotia, p131	U.
President Hayes, p140	Scythia, p132	
President Hoover, p117	Shanghai Maru, p130	Ulster Monarch, p131
President Monroe, p140	Shinyo Maru, p120	Ulster Prince, p131
President Polk, p140	Shropshire, p145	Ulster Queen, p131
President Roosevelt, p138	Sierra Nevada, p142	Ulysses, p133
President Vanburen, p140	Simon Bolivar, p130	Upwey Grange, p158
Prince Baudouin, p166	Sinai, p129	Uruguay, p146
Prince David, p113	Sir James Clark Ross, p135	
Prince Henry, p113	Silverpalm, 152	
Prince Robert, p113	Silverwillow, 152	
Princess, p158	Silveryew, 152	
Princess Elaine, p113	Somersetshire, p153	
Princess Kathleen, p113	Southern Prince, p142	V.
Princess Marguerite, p113	Sphinx, p127	
Pyrrhus, p152	St. Louis, p122	Vancolite, p139
	Staffordshire, p145	Vandyck, p139
Q.	Statendam, p110	Veendam, p121
Queen Mary, p108	Stavangerfjord, p123	Venus, p130
Queen of Bermuda, p112	Stella Polaris, p165	Viceroy of India, p118
	Stockwell, p159	Victolite, p139
R.	Strathaird, p111	Victoria, p122
Rajputana, p121	Strathnaver, p111	Vienna, p131
Rajula, p151	Stuart Star, p147	Vimale, p154
Ranchi, p121	Suecia, p165	Virginia, p118
Rangatira, p130	Sultana Star, p144	Volendam, p121
Rangitane, p123	Surrey, p151	Voltaire, p139
Rangitata, p123	Suwa Maru, p139	Vulcania, p132
	T.	W.
Ranjitana, p123	Tafelberg, p140	Waipawa, p138
Ranpura, p121	Tairea, p113	Wairangi, p138
Rawalpindi, p121	Tainui, p151	Waiwera, p138
Reino del Pacifico, p121	Tajandoen, p150	Wanganella, p128
Reliance, p111	Takada, p157	Warwick Castle, p116
Remuera, p144	Takihiwa, p113	Washington, p115
Resolute, p111	Talamba, p113	Westernland, p119
Rex, p114	Talma, p129	Western Prince, p142
Rhexenor, p152	Tamaroa, p141	Westralia, p157
Rio de Janeiro Maru, p150	Taronga, p145	Winchester Castle, p116
Rodney Star, p147	Tatsuta Maru, p120	Windsor Castle, p107
Rohna, p151	Teiresias, p152	Worcestershire, p145
Roma, p115	Tekoa, p151	
Rotterdam, p116	Terukuni Maru, p140	Y.
Ruahine, p147	Themistocles, p140	Yasukuni Maru, p140
	Théophile Gautier, p129	Yorkshire, p146
S.	Thurland Castle, p150	
Samaria, p132	Tilawa, p129	
San Melito, p136	Tjibadak, p157	Z.
San Richardo, p160	Tjinegara, p156	Zealandia, p162
San Silvestre, p160	Tjisadane, p156	Zealandic, p145
San Tirso, p160	Tokai Maru, p155	Zeelandia, p156
	Tongariro, p151	Zent, p164
	Transylvania, p112	

## INDEX TO ADVERTISERS.

---

	PAGE
BARR AND STROUD, LTD. .. .. .. .. .. .. ..	xiii
BROWN AND Co., LTD., JOHN .. .. .. .. .. .. ..	ix
CLOWES & SONS, LTD., WILLIAM .. .. .. .. .. .. ..	xiv
HADFIELDS LTD. .. .. .. .. .. .. .. ..	iii
IVOR POWER SPECIALITY Co., LTD. .. .. .. .. .. .. ..	v
NAVY RECORDS SOCIETY .. .. .. .. .. .. .. ..	vi
P. & O. .. .. .. .. .. .. .. ..	viii
SILURIFICIO WHITEHEAD S.A. .. .. .. .. .. .. ..	xiv
THORNYCROFT AND Co., LTD., JOHN I. .. .. .. .. .. .. ..	x
UNION CASTLE LINE.. .. .. .. .. .. .. ..	xi
VICKERS-ARMSTRONGS, LTD. .. .. .. .. .. .. ..	i and xii
WALLSEND SLIPWAY AND ENGINEERING Co., LTD. .. .. .. .. .. ..	iv
WHITE & Co., LTD., J. SAMUEL .. .. .. .. .. .. ..	ii
YARROW AND Co., LTD. .. .. .. .. .. .. ..	vii



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